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Limited Liability and the Known Unknown
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Limited Liability and the Known Unknown

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Abstract

Limited liability is a double-edged sword. On the one hand, limited liability may help overcome investors' risk aversion and facilitate capital formation and economic growth. On the other hand, limited liability is widely believed to contribute to excessive risk taking and externalization of losses to the public. The externalization problem can be mitigated imperfectly through existing mechanisms such as regulation, mandatory insurance, and minimum capital requirements. These mechanisms could be more effective if information asymmetries between industry and policymakers could be reduced. Private businesses will typically have better information about industry-specific risks than policymakers.

A charge for limited liability entities—resembling a corporate income tax but calibrated to risk levels—could have two salutary effects. First, a well-calibrated limited liability tax could help compensate the public fisc for risks and reduce externalization. Second, a limited liability tax could force private industry actors to reveal information to policymakers and regulators, thereby dynamically improving the public response to externalization risk.

Charging firms for limited liability will lead private firms to sort themselves by riskiness and reveal information to policymakers. Policymakers will then be able to focus their attention on the industries that have collectively self-identified as high risk and develop more finely tailored regulatory responses. Because the benefits of making the proper election are fully internalized by individual firms, whereas the costs of future regulation or limited liability tax changes will be borne collectively by industries, firms will be unlikely to strategically mislead policymakers in their elections. By helping to reveal private information and focus regulators' attention, a limited liability tax could accelerate the pace at which policymakers learn and therefore the pace at which regulations improve.

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Introduction: The Lifecycle of Risk and Limited Liability

The last two centuries have seen remarkable progress in global wealth and health. Since 1900, real GDP per capita has increased more than five-fold,¹ while global life expectancy has more than doubled.² Improvements in life expectancy and quality of life, while facilitated by rising levels of productivity and prosperity, appear to be due in large part to the growth of scientific knowledge and its application to personal and public health.³

Business investment is an important driver of economic growth and innovation. However, economic activity can entail substantial risks to life and property, not only for investors, but for the broader public. These risks are often unknown or at best incompletely understood.

Investors are skittish about accepting potentially unlimited liability for risks they only partially understand. Investors and business promoters have therefore lobbied for and been granted easy access to limited liability. Limited liability prevents investors from losing more than the capital that they invest in a business. As profits accumulate (or the business winds down), investors can liberate capital from the hazardous confines of an operating company and provide it with a safer perch.

¹ Jutta Bolt & Jan Luiten van Zanden, *The Maddison Project: Collaborative Research on Historical National Accounts*, 67 ECON. HIST. REV. 627, 635 (2014).

² James C. Riley, *Estimates of Regional and Global Life Expectancy, 1800-2001*, 31 POPULATION & DEV. REV. 537, 542 (2005); JAMES C. RILEY, *RISING LIFE EXPECTANCY: A GLOBAL HISTORY* (2001).

³ David Cutler, Angus Deaton & Adriana Lleras-Muney, *The Determinants of Mortality*, 20 J. ECON. PERSP. 97, 115 (2006).

Limited liability is a double-edged sword. On the one hand, limited liability may help overcome investors' risk aversion and facilitate capital formation and economic growth. On the other hand, limited liability is widely believed to contribute to excessive risk taking and externalization of losses to the public. Limited liability cannot eliminate risk. Limited liability can only transfer the adverse consequences of risk away from those who effectively decide how much risk to take and, in so doing, encourage greater risk taking.

Over time, a given risk that was once unknown will become increasingly familiar, identifiable, measureable, predictable and ultimately possible to regulate or insure.⁴ Unknown risks often have a life cycle. In the early stages, risks begin to reveal themselves to those most intimately familiar with an activity. Near misses proliferate and relatively small private losses accumulate, but the magnitude of any loss externalization is too small to capture the attention of the public or policymakers.⁵ Private businesses and their sophisticated investors will typically have better information about industry-specific risks than policymakers. Private market actors who are most attuned to these risks may move to insulate themselves and externalize the risk onto others who are less knowledgeable.⁶ Over time, as economic activity increases and the cumulative probability of negative outcomes rises, externalized losses grow.

Today we take it for granted that industrial pollution is a health hazard. Many air pollutants cause severe and costly respiratory and cardiovascular problems for individuals who neither earn their livelihoods producing industrial goods nor make use of the responsible products. Pollution is the classic example of an externality.⁷ But while industrialization began in Britain in the late 18th century, links between air pollution and health only began to be researched in the United States in the 1950s after particularly bad incidents of severe pollution in the 1940s and 1950s commanded attention. Air pollution was not regulated at the federal level until the 1970s.⁸ Recent research continues to identify new links between health problems and man-made sources of pollution.⁹

It seems likely that individuals directly involved in industry, with greater exposure and greater expertise, would have been cognizant of health risks sooner than the public or policymakers. For example, many tobacco company scientists believed as early as the 1950s that smoking was harmful to health. Yet the tobacco industry publicly maintained as late as 1999 that there was no scientific proof that tobacco causes health problems.¹⁰

⁴ Michelle Boardman, *Known Unknowns: The Illusion of Terrorism Insurance*, 93 GEO. L.J. 783, 786 (2005).

⁵ Anthony J. Casey & Eric A. Posner, *A Framework for Bailout Regulation*, 91 NOTRE DAME L. REV. 479, 496 (2015) (describing financial services, manufacturing, and transportation bailouts).

⁶ Saul Levmore, *Coalitions and Quakes: Disaster Relief and Its Prevention*, 3 U. CHI. L. SCH. ROUNDTABLE 1, 4, 7, 9 (1996); Jeffrey Manns, *Building Better Bailouts: The Case for a Long-Term Investment Approach*, 63 FLA. L. REV. 1349, 1362, 1368, 1383 (2013); Steven Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 210–211, 225 & n.198 (2008).

⁷ William J. Baumol, *On Taxation and the Control of Externalities*, 62 AM. ECON. REV. 30, 307 (1972).

⁸ Alvin Powell, *Air Pollution's Invisible Toll*, HARVARD UNIVERSITY CENTER FOR THE ENVIRONMENT, June 9, 2014, <http://environment.harvard.edu/news/huge-headlines/air-pollution-invisible-toll>; US EPA, HISTORY OF AIR POLLUTION US EPA (2014), <https://www.epa.gov/air-research/history-air-pollution>.

⁹ Chris A. McLinden et al., *Space-Based Detection of Missing Sulfur Dioxide Sources of Global Air Pollution*, 9 NATURE GEOSCIENCE 1, 1 (2016); Michael S. Friedman et al., *Impact of Changes in Transportation and Commuting Behaviors During the 1996 Summer Olympic Games in Atlanta on Air Quality and Childhood Asthma*, 285 JAMA 897, 897 (2001).

¹⁰ K. M. Cummings, C. P. Morley & A. Hyland, *Failed Promises of the Cigarette Industry and Its Effect on Consumer Misperceptions About the Health Risks of Smoking*, 11 TOBACCO CONTROL i110, i110 (2002); NAOMI

If losses grow large enough, they will capture the attention of the public and of policy-makers, and may lead to post-hoc bailouts or relief efforts.¹¹ Even without an identifiable bailout, externalized costs may burden social programs that insure against poor health, disability, or poverty, or programs that provide for public safety.¹² The social costs of relief efforts eventually creates pressure to regulate the activity to reduce risks, or to introduce a formalized system of mandatory insurance in which industry participants (or vulnerable groups) pay, at least in part, for the relief that they are likely to eventually receive.¹³ Formal insurance schemes become more tenable as risks become more clearly identified, measurable and actuarially predictable.¹⁴

This lifecycle model roughly describes the evolution of bailouts, regulation, and compulsory insurance schemes in many different industries and at various points in U.S. history.¹⁵ What should be noted is that during the early stages of the cycle, when risks are poorly understood by most, limited liability provides investors with insurance-like benefits without the expense of insurance premiums or the restraint and cost of safety regulation.¹⁶ (It is possible that at later stages, the public reaction could lead to overregulation.)¹⁷

Given the long history of iterative discovery of risk, it seems likely that at any given point in time: (1) there will be risks that are largely unknown and unknowable to most parties; (2) the best information about these risks, albeit potentially very limited, may be in the hands of industry participants; (3) limited liability, dividends, interest payments and other judgment-proofing strategies enable investors and industry participants to benefit from gains while externalizing losses onto third parties (particularly where limited liability does not correct existing risk aversion or agency costs); (4) holding the costs of these strategies constant, externalization strategies will most often be used where the benefits are greatest—that is, where there is the greatest opportunity to externalize losses that would otherwise have been borne by investors.

The fact that these risks are not known and are not precisely quantifiable does not mean that nothing should be done to address them. We can safely assume that the costs of externalized risks—and the commensurate benefits to investors and employees—are greater than

ORESKES & ERIK M. CONWAY, *MERCHANTS OF DOUBT: HOW A HANDFUL OF SCIENTISTS OBSCURED THE TRUTH ON ISSUES FROM TOBACCO SMOKE TO GLOBAL WARMING* (2011).

¹¹ Adam J. Levitin, *In Defense of Bailouts*, 99 GEO. L.J. 435, 438–39 (2011); Levmore, *supra* note 6 at 4, 15, 17; DAVID SKEEL, *THE NEW FINANCIAL DEAL: UNDERSTANDING THE DODD-FRANK ACT AND ITS (UNINTENDED) CONSEQUENCES* 1, 132–35 (2010); Manns, *supra* note 6 at 1361; Jeffrey Manns, *Insuring Against Terror?*, 112 YALE L.J. 2509, 2526 (2003).

¹² Levmore, *supra* note 6 at 5, 9–12, 31 (discussing unemployment and health insurance).

¹³ *Id.* at 12 ("experience with flood relief has generated both subsidized flood insurance programs and attempts to regulate the quantity and quality of development in flood plains."), 13 ("The federal government could require private insurance, local building codes, zoning strategies, and other steps that might efficiently reduce the need for post-disaster relief at no obvious expense to the federal fisc."). Manns, *supra* note 6 at 1381.

¹⁴ See *infra* note 116.

¹⁵ Levmore, *supra* note 6 at 1–2, 12 (describing the development of federal flood insurance); Federal Deposit Insurance Corporation, *A Brief History of Deposit Insurance in the United States*, , 3–4, 7, 17–27 (1998); RILEY E. DUNLAP, MICHAEL E. KRAFT & EUGENE A. ROSA, *PUBLIC REACTIONS TO NUCLEAR WASTE: CITIZENS' VIEWS OF REPOSITORY SITING* 32–34 (1993) (describing the gradual growth of public awareness of risks of nuclear power and resulting development of safety regulation and public insurance).

¹⁶ Levmore, *supra* note 6 at 25.

¹⁷ Roberta Romano, *Regulating in the Dark*, YALE LAW & ECONOMICS RESEARCH PAPER (2012), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1974148 (last visited Feb 6, 2015); Brett McDonnell, *Dampening Financial Regulatory Cycles*, 65 FLA. L. REV. 1597 (2013).

zero. Thus, even a modest countervailing policy could be an improvement over the status quo.¹⁸

A contemporaneous charge for limited liability and asset shielding entities—loosely modeled on the corporate income tax but more closely calibrated toward risk levels—might offer a promising solution, or at least an incremental improvement over the status quo. This may be true notwithstanding the inevitable challenges of accurately measuring risk levels *ex ante*, and of enforcing unlimited liability *ex-post*.

Indeed, simply introducing such a charge will dynamically improve regulators' and policymakers' ability to price and police unknown risks. This is because industry participants' choices to pay the proposed fee or forgo protection will reveal information to regulators and policymakers about knowledgeable parties' internal assessments of risk.

When limited liability comes at a cost, those who believe that they are engaged in more risky activities will be more likely to opt into limited liability, while those who believe their actions are comparatively benign will be more likely to forgo it.¹⁹ If limited liability were priced uniformly relative to scale, then variation in the proportion of similar firms that opted into limited liability would reveal information about private assessments of the relative riskiness of various activities. Although risks are assumed to be near uniform within a group, information about risk and perceptions of risks still vary among members of the group.²⁰ Thus, elections regarding limited liability aggregate and reveal information about risk, much as market pricing or prediction markets aggregate and reveal information.²¹ Regulators could use this information to more closely study and eventually regulate or insure high-risk activities.

Regulators could also iteratively reprice limited liability in subsequent periods, charging different prices to different risk-pooled groups of firms based on information revealed in the previous period.²² Thus, a risk-uniform group in which relatively few or no firms opted into limited liability in the previous period—thereby signaling relatively low risk for the group—would see the price of limited liability fall in the next period. On the other hand, a risk-uniform group in which a very large proportion of firms opted into limited liability—thereby signaling relatively high risk—would see the price of limited liability increase in subsequent periods. Because the benefits of making the proper election are fully internalized by individual firms, whereas the costs of future regulation or limited liability tax changes will be borne collectively by the risk-uniform group (i.e., competitors within an industry), firms will be unlikely to strategically mislead policymakers through their elections.

¹⁸ GLENN SHAFER, A MATHEMATICAL THEORY OF EVIDENCE (discussing Bayesian priors) (1976); Manns, *supra* note 6 at 1369.

¹⁹ Ian Ayers has noted the advantages of penalty defaults as a mechanism to force informed parties to share information with counterparties by attempting to contract around the default rule. Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 98–100 (1989).

Alex Raskolnikov has similarly proposed to use tax elections to force taxpayers to self-sort and reveal information about their propensity for tax evasion. Alex Raskolnikov, *Revealing Choices: Using Taxpayer Choice to Target Tax Enforcement*, 109 COLUM. L. REV. 689, 691 (2009).

²⁰ In other words, risks are uniformly distributed within each group, but perceptions of risk are non-uniformly distributed. A simplifying assumption would be that such information is normally distributed.

²¹ Sanford Grossman, *On the Efficiency of Competitive Stock Markets Where Trades Have Diverse Information*, 31 J. FIN. 573, 574 (1976); Ronald J. Gilson & Reinier H. Kraakman, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 585 (1984); Justin Wolfers & Eric Zitzewitz, *Prediction Markets*, 18 J. ECON. PERSP. 107, 112 (2004).

²² See, e.g., Mitchell A. Kane, *Taxation and Multi-Period Global Cap and Trade*, 19 NYU ENVTL. L.J. 87 (2011) (discussing a multi-period, multi-jurisdictional cap and trade system).

When prices are set such that similar firms are roughly equally likely to choose limited liability or forgo it, we can infer that the cost of limited liability was priced roughly at its value.²³ At this point, differences in the price of limited liability for different categories of firms would be a good indicator of differences in residual risk that were known or suspected by industry participants, but unknown to regulators or the public.

Regulators may be able to group firms into risk pools only imperfectly; firms within a group will inevitably be less than perfectly uniform. However, this can also be an information-forcing mechanism that could lead to dynamic improvements over time. Low-risk firms that are mistakenly grouped with high-risk firms have incentives to reveal industry-specific information that can help regulators and policymakers better distinguish between high-risk and low-risk firms.

Costly, rather than costless, limited liability could thereby pressure industry to share information with the public through limited liability election. By helping to reveal private information and focus regulators' attention, a limited liability tax could accelerate the pace at which policymakers learn and therefore the pace at which regulations improve.

Part I of this article discusses the reasons for limited liability. Part II considers limited liability as a form of insurance. Part III explains how limited liability can facilitate externalization. Part IV provides a range of estimates of how large the externalization problem might be. Part V describes previous solutions to the externalization problem and their limitations. Part VI presents a novel approach to charging for limited liability and iteratively pricing it to force firms to reveal information about internal assessments of risks to the public. Part VII discusses some administrative details. The conclusion follows.

I. Reasons for Limited Liability

Liability is limited without the law making it so. Individuals and firms are often capable of producing harm that exceeds their capacity to compensate victims because both assets and future earning capacity are limited. This is known as the “judgment proof problem.”²⁴

Scholarship addressing the judgment proof problem and related issues has focused on losses imposed on non-adjusting or involuntary creditors—such as government or tort victims—because sophisticated financial investors such as bank lenders are believed to protect themselves from risk through negotiated lending terms such as interest rates, security, and covenants.²⁵ Because sophisticated creditors can obtain priority and maximize recovery for themselves in the event of losses, or demand high interest rates to compensate them for risk, unsophisticated creditors who typically lack such protections cannot free ride on sophisticated creditors’ efforts.

²³ If we assume some risk aversion, then the optimal price may be one at which more than half of firms are likely to choose limited liability, though not all. If all firms chose limited liability, that would be a clear sign that limited liability was underpriced.

²⁴ Steven Shavell, *Liability for Harm versus Regulation of Safety*, 13 J. LEGAL STUD. 357, 360–61 (1984); Steven Shavell, *A Model of the Optimal Use of Liability and Safety Regulation*, 15 RAND J. ECON. 271, 271 (1984).

²⁵ Victor Brudney, *Corporate Bondholders and Debtor Opportunism: In Bad Times and Good*, 105 HARV. L. REV. 1821, 1821 (1992); Lucian Arye Bebchuk & Jesse M. Fried, *The Uneasy Case for the Priority of Secured Claims in Bankruptcy*, 105 YALE L.J. 857, 882 (1996); Yair Listokin, *Is Secured Debt Used to Redistribute Value from Tort Claimants in Bankruptcy? An Empirical Analysis*, 57 DUKE L.J. 1037, 1051 (2008).

Judgment proofing can lead to overinvestment in risky activities, underinvestment in safety precautions, and underinsurance.²⁶ In other words, the judgment proof problem is not simply a question of distribution—it also raises efficiency concerns.

The law limits liability even further. State property exemption laws and the federal bankruptcy code shield many individual assets—and in the case of bankruptcy, much of future income—from the reach of most creditors. State business entity laws provide limited liability for investors in corporations and other entities. Legislators created these limits on liability to help overcome individual risk-aversion, facilitate transferability of equity ownership and reduce search costs, and facilitate socially beneficial investments.

Stephen Bainbridge and M. Todd Henderson trace the historical origins of limited liability to Sovereign Immunity.²⁷ Early corporations were granted exclusive authority to perform functions that had traditionally been performed by the state, and therefore enjoyed state-like protection from creditors.²⁸ According to Bainbridge, Henderson, and Stephen B. Presser, broad-based limited liability became widely available to small businesses in the United States because of decentralization of corporate law, competition between states for charters and investment, and political pressure from business leaders and their lawyers.²⁹

Bainbridge and Henderson applaud this development. They view limited liability as helpful, and perhaps even essential, to capital formation and economic growth.³⁰ Limited liability helps overcome investors' risk aversion in a world in which businesses' vast needs for capital and professional expertise necessitate separation of ownership and control. Limited liability also eliminates the complexity and illiquidity that could result if an individual investor's personal liability turned on the personal wealth of other investors or the particular time when frequently traded investments were owned.³¹ And while shareholders and many voluntary creditors could contract for limited liability, limited liability saves them the time and expense.

The prospect of imposing unlimited liability on contractual counterparties and creditors in the general course would be a radical departure from established practice.³² Although

²⁶ Shavell, *supra* note 24; Henry Hansmann & Reinier Kraakman, *Toward Unlimited Shareholder Liability for Corporate Torts*, 100 YALE L.J. 1879, 1882–83 (1991); Lynn M. LoPucki, *The Death of Liability*, 106 YALE L.J. 1–92, 20–22 (1996).

This assumes the background legal liability regime either appropriately deters or under-deters excessive risk-taking when judgments are fully collectible. In other words, [expected liability] \leq [expected harm]. Shavell argues that setting liability equal to harm in individual cases could under-deter, because there is some probability that in cases in which harm is done, tortfeasors will not be identified, suit will not be brought, or plaintiffs will not prevail. Shavell, *supra* note 24 at 363–70. Those who believe that tort liability is excessive may view limited liability and asset protection as back-door corrective reforms. Charles W. Mooney Jr., *Judgment Proofing, Bankruptcy Policy, and the Dark Side of Tort Liability*, 52 STAN. L. REV. 73, 75 (1999).

²⁷ STEPHEN BAINBRIDGE & TODD HENDERSON, LIMITED LIABILITY 20–32 (2016).

²⁸ Robert Hockett & Saule Omarova, “Special,” Vestigial, or Visionary? *What Banking Regulation Tells Us About the Corporation—and Vice Versa*, 39 SEATTLE U. L. REV. 453, 463–69 (2016).

²⁹ BAINBRIDGE AND HENDERSON, *supra* note 27 at 32–38, 52–53, 77, 230; STEPHEN PRESSER, PIERCING THE CORPORATE VEIL, 2013 ED. 21–30 (2013).

³⁰ BAINBRIDGE AND HENDERSON, *supra* note 27 at 19, 302–303.

³¹ *Id.* at 11–12, 54–66, 82–83.

³² Lenders and contractual counterparties may face liability—beyond the loss of their investment—in very limited contexts related to cleanup of hazardous waste under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and related legislation. Rohan Pitchford, *How Liable Should a Lender Be? The Case of Judgment-Proof Firms and Environmental Risk*, 85 AM. ECON. REV. 1171, 1181–82 (1995).

lender liability might improve efficiency in some contexts,³³ most advocates of unlimited shareholder liability have shied away from lender and contractual counterparty liability except in limited and extraordinary circumstances because of fears that such liability would exacerbate conflict within the capital structure and create information problems.³⁴ Unlimited liability for investors makes the value of the investment to each investor dependent on the wealth of other investors who can satisfy judgments if liability is joint and several.³⁵ It also raises complicated problems about the timing of ownership of a stake in a firm and when liability should attach, which could dramatically restrict liquidity.

Even when liability is not limited by law, it may be limited in fact by the high costs of collecting small sums from many investors. Such practical considerations influence doctrine. For example, although fraudulent transfer law and nationally uniform procedures in bankruptcy theoretically could be used to recover payouts to shareholders or bondholders following a leveraged buyout that leaves a corporation undercapitalized, courts have broadly construed a variety of legal defenses that make such remedies particularly unlikely against small investors.³⁶ In the modern era, with more sophisticated techniques of judgment proofing and financial engineering widely available, retroactive recoveries might be substantially lower and costs of collection substantially higher.

Empirical evidence suggests that large, capital intensive businesses can function without limited liability for shareholders, at least in certain legal environments.³⁷ In the late 19th and early 20th centuries, double liability regimes for shareholders of commercial banks permitted partial recoveries, though often at substantial cost and delay.³⁸ American Express operated without limited liability until the 1960s.³⁹

³³ Pitchford, *supra* note 32.

³⁴ Hansmann and Kraakman, *supra* note 26 at 1930; David W. Leeborn, *Limited Liability, Tort Victims, and Creditors*, 91 COLUM. L. REV. 1565, 1641–43 (1991); Alan O. Sykes, *The Economics of Vicarious Liability*, 93 YALE L.J. 1231–1280, 1253 (1984); Douglas G. Baird, *The Importance of Priority*, 82 CORNELL L. REV. 1420, 1429–31 (1997).

³⁵ Joseph A. Grundfest, *The Limited Future of Unlimited Liability: A Capital Markets Perspective*, 102 YALE L.J. 387, 441 (1992).

³⁶ Michael Simkovic & Benjamin S. Kaminetzky, *Leveraged Buyout Bankruptcies, the Problem of Hindsight Bias, and the Credit Default Swap Solution*, 2011 COLUM. BUS. L. REV. 118, 133–34 (2011); Michael L. Cook, ANOTHER COURT OF APPEALS BROADLY READS SETTLEMENT PAYMENT SAFE HARBOR HARVARD LAW SCHOOL BANKRUPTCY ROUNDTABLE (2014).

³⁷ E. Merrick Dodd, *The Evolution of Limited Liability in American Industry: Massachusetts*, 61 HARV. L. REV. 1351, 1356 (1948); Mark I. Weinstein, *Don't Buy Shares Without It: Limited Liability Comes to American Express*, 37 J. LEGAL STUD. 189, 194 (2008); Mark I. Weinstein, *Share Price Changes and the Arrival of Limited Liability in California*, 32 J. LEGAL STUD. 1, 2–3 (2003); Jonathan R. Macey & Geoffrey P. Miller, *Double Liability of Bank Shareholders: History and Implications*, 27 WAKE FOREST L. REV. 31, 55 (1992).

Critics have suggested that changes in substantive and procedural law such as the rise of mass torts and class action lawsuits have increased potential liability dramatically. Previous periods when large businesses operated without the benefit of limited liability might therefore not predict what would happen in the current legal regime if limited liability were removed. Richard A. Posner, *The Rights of Creditors of Affiliated Corporations*, 43 U. CHI. L. REV. 499, 515 (1976); BAINBRIDGE AND HENDERSON, *supra* note 27 at 40–42, 66. Others argue that unprecedented abundance of financial capital makes current investors more risk-tolerant. Hockett and Omarova, *supra* note 28 at 485–87.

³⁸ Peter Conti-Brown, *Elective Shareholder Liability*, 64 STAN. L. REV. 409, 436, 458–59 (2012); Macey and Miller, *supra* note 37 at 55 (finding nominal 50 percent recovery rates over time); Howell E. Jackson, *Losses from National Bank Failures during the Great Depression: A Response to Professors Macey and Miller*, 28 WAKE FOREST L. REV. 919, 922 (1993) (noting substantial delays and challenges of collecting from shareholders, especially during the Great Depression).

³⁹ Weinstein, *supra* note 37.

Nevertheless, the view that limited liability attracts investors is relatively uncontroversial. Henderson and Bainbridge, though clearly strong proponents of limited liability, acknowledge that limited liability creates problems of its own—private profits can be amplified, with no social benefit, through externalization of losses onto the public.⁴⁰

Henry Hansmann views limited liability for torts as a largely unnecessary and unfortunate development in corporate law. Hansmann acknowledges that *joint and several* unlimited liability might create search costs and information problems for investors—who would be concerned with the wealth of other investors in a venture and their capacity to pay judgments. However, Hansmann’s analysis suggests that proportionate unlimited liability for torts—that is, liability proportionate to an investor’s stake in the business—would not create such problems and would avoid many of the problems associated with limited liability.⁴¹ Proportionate unlimited liability for torts is therefore an alternative to limited liability.

II. *Limited Liability as Mispriced Insurance*

Given the choice between proportionate unlimited liability and limited liability, many investors may nevertheless prefer limited liability. Legal scholars have generally concluded that the benefits of providing limited liability usually outweigh the costs. But this does not necessarily mean that governments should provide limited liability *for free*, any more than governments should provide costly physical infrastructure without charging user fees.⁴²

Limited liability resembles insurance. Limited liability entities obtain benefits like insurance, in that the owners of limited liability entities can offload risks of certain losses. In insolvencies of limited liability entities, some losses are borne by governments. Indeed, actual insolvency is unnecessary for limited liability to facilitate loss externalization. The mere specter of liability pushing a firm to the brink of insolvency might persuade regulators, courts and plaintiffs to agree to lower damages, or forgo litigation altogether rather than expend resources seeking damages that would be uncollectible.⁴³

Insurance providers routinely charge a premium for bearing the risk of loss, depending on the extent of the risk. Private insurance companies will only insure risks that are specific, limited and quantifiable so that actuarial analysis can suggest profitable insurance pricing. Limited liability effectively provides uncapped insurance for any risk that might materialize, no matter how unpredictable or poorly understood. No private insurance company would offer insurance on these terms, at any price. The catastrophic insurance provided by limited

⁴⁰ BAINBRIDGE AND HENDERSON, *supra* note 27 at 47–51, 225.

⁴¹ Hansmann and Kraakman, *supra* note 26; Henry Hansmann & Reinier Kraakman, *The End of History for Corporate Law*, 89 GEO. L.J. 439, 442 (2001).

⁴² See, e.g., GILLIAN HADFIELD, RULES FOR A FLAT WORLD: WHY HUMANS INVENTED LAW AND HOW TO REINVENT IT FOR A COMPLEX GLOBAL ECONOMY (2016) (comparing business law to physical infrastructure).

⁴³ Relatively few potential plaintiffs sue and damages awarded and actually collected tend to be modest. Deborah Jones Merritt & Kathryn Ann Barry, *Is the Tort System in Crisis—New Empirical Evidence*, 60 OHIO ST. L.J. 315, 315 (1999). Deep pocketed institutions are targeted more often than individuals of questionable ability to pay. Theodore Eisenberg et al., *Juries, Judges, and Punitive Damages: An Empirical Study*, 87 CORNELL L. REV. 743, 749 (2001). Litigation routinely settles for the maximum amount of defendants’ insurance coverage. David A. Hyman et al., *Do Defendants Pay What Juries Award? Post-Verdict Haircuts in Texas Medical Malpractice Cases, 1988–2003*, 4 J. EMPIRICAL LEGAL STUD. 3, 3 (2007).

liability, essentially gratis, is clearly underpriced when virtually all businesses that are aware of the availability of limited liability opt into it.

Limited liability, properly priced and accompanied by appropriate safety regulation, could create value, just as insurance helps create value by overcoming risk aversion, aggregating information about risk, and spreading sensible precautions.

III. How Limited Liability Can Exacerbate Externalization

Limited liability exacerbates numerous problems related to judgment proofing. This is because limited liability caps how much investors can lose at a relatively low fraction of the investors' net-worth and shields investors' personal income. Limited liability also facilitates diversification, which dramatically increases the likelihood that a business strategy of externalizing harm will benefit investors, even those with relatively short time horizons and limited assets. Limited liability combined with diversification causes investors to behave as if they are risk neutral, because uncorrelated volatility within individual investments does not lead to high volatility in the total value of a diversified portfolio of investments.

Thanks to limited liability and diversification, a strategy of externalization can boost private returns without increasing personal financial risks. Therefore, businesses that are managed with the primary goal of maximizing shareholder value *should* pursue externalization strategies whenever such strategies are available. Presumably, they often do pursue such strategies.

A. Asymmetric payoffs and limited assets at risk

Parties that are judgment proof face asymmetric payoffs—unlimited upside potential and downside risk that is capped at the level of their assets and future earning capacity. Downside exceeding this cap will be externalized onto third parties, and will not affect the judgment-proof party. Consider a nuclear power plant operator that could inadvertently render large portions of a city uninhabitable. If a disaster occurs, the operator will be unable to provide adequate compensation from its own assets, no matter the liability regime.

From the perspective of a profit-maximizing, judgment-proof nuclear power plant operator with \$100 million in assets,⁴⁴ there is no difference between a nuclear disaster that produces \$120 million in damages—\$20 million more than they can ever compensate—and \$120 billion in damages—\$119.9 billion more than they can ever compensate.

Thus, skimping on maintenance in a way that will increase profitability in good times but increase the magnitude of an already catastrophic disaster, if one materializes, could maximize private benefits for the nuclear power plant operators' investors, while causing social harm. The dangers of nuclear power may be relatively well understood and highly regulated today. They were not always. Consider how poorly equipped regulators are to

⁴⁴ This example implicitly assumes that going concern value is not substantially higher than asset value. Otherwise, the example is still correct as long as the amount of the judgment exceeds the greater of asset value or going concern value.

constrain high magnitude, low probability risks that are not widely known or understood outside of industry until *after* disaster strikes.

1. Increasing variability of outcomes

Business activities have uncertain outcomes that can be understood as probability distributions, with the most likely outcomes having greater density (i.e., appearing taller on a frequency plot) and the least likely outcomes—typically those that are extremely positive or negative⁴⁵—having lower densities.

Holding all else constant,⁴⁶ the wider the probability distribution (the more extreme the outcomes) and the fatter the tails of the distribution (the more likely extreme outcomes), the more likely it is that negative outcomes will exceed the capacity to compensate victims. Because normally distributed outcomes are symmetrical, increasing the variance of the probability distribution—that is, taking on bigger risks—will increase the upside benefits for the judgment-proof party far more than the downside risks that it will face.⁴⁷ For example, skimping on maintenance and inspections may reduce operating costs and increase profits if all goes well, but may also increase the likelihood of a disaster and the harm from a disaster if things go poorly.

Consider a simple mathematical example.⁴⁸ A particular investment has an expected value of zero when all costs and benefits are internalized. The investment will only be undertaken once. There is a 90 percent chance that the investment produces \$100 million in

⁴⁵ Extreme outcomes are relatively unlikely when the distribution of outcomes is normal (i.e., bell-shaped). Many but not all natural phenomena follow a normal distribution. Extreme outcomes are no less likely than median or mean outcomes when the distribution is uniform (i.e., rectangular). In a few situations, the distribution of outcomes may be such that extreme outcomes are *more* likely than moderate outcomes. The extent to which extreme outcomes are likely, relative to their likeliness under a normal distribution, is measured by kurtosis.

⁴⁶ That is, holding constant assets and future earning potential and expected returns. Expected return is the weighted average of the outcomes, i.e., the sum of the probability of each outcome multiplied by its magnitude.

⁴⁷ Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239, 313 (1984).

⁴⁸ In mathematical notation,

a	=	investor assets and future income available for collection; $a \geq 0$
f_u	=	likelihood of upside scenario; $0 < f_u < 1$
f_d	=	likelihood of downside scenario; $f_d = 1 - f_u$
m_u	=	magnitude of upside scenario; $m_u > 0$
m_d	=	magnitude of downside scenario; $m_d < 0$
V_s	=	Expected value to society
V_p	=	Expected value to investor

$$V_s = (f_u \cdot m_u) + (f_d \cdot m_d)$$

$$V_p = (f_u \cdot m_u) + (f_d \cdot -\min(a, -m_d))$$

Thus,

$$V_p = V_s \quad \text{if} \quad a \geq -m_d$$

$$V_p > V_s \quad \text{if} \quad a < -m_d$$

The difference between the expected value to investor and the expected value to society (assuming $a < -m_d$), is

$$V_p - V_s = f_d \cdot (-\min(a, -m_d) - m_d)$$

profits. There is a 10 percent chance that the investment produces \$900 million in losses. The expected value of the more likely, profitable scenario is \$90 million while the expected value of the less likely, unprofitable scenario is negative \$90 million. The overall expected value of the investment is zero. It does not make sense for a risk neutral investor to make this investment, because there is nothing to be gained in expectation. (For a risk-averse investor who fears losses more than he values gains, this investment is even less attractive.)

Now introduce judgment proofing. Assume the investor has \$900 million in assets, so that he would have fully internalized the potential losses in the investment scenario described above. However, the investor takes on greater risks (i.e., increases the variance of potential outcomes) without increasing his assets. The investment now has a 90 percent chance of producing \$500 million in profits and a 10 percent chance of losing \$4.5 billion. Because both the upside and downside have quintupled, with all gains and losses fully internalized, the investment still has an expected value of zero.

However, because the judgment-proof investor can lose at most \$900 million—all of his assets—if the unprofitable scenario materializes, from the investor's perspective the expected value of the unprofitable scenario remains negative \$90 million (10 percent chance of losing \$900 million), while the expected value of the profitable scenario has increased to \$450 million, making the total expected value of the investment \$360 million to the investor and zero to society. A risk neutral investor should now undertake this investment.

By changing the numbers slightly, we can also make an investment with *negative* value to society profitable for the investor. Thus, investors would (on average and in expectation) be able to enrich themselves by destroying value and making everyone else worse off.

Companies seeking to maximize value for shareholders might actively seek to create probability distributions in which all potential losses are concentrated in scenarios in which the firm will already be insolvent, because this maximizes the chances of externalizing losses onto other parties.⁴⁹

2. Reducing assets at risk

Holding all else constant,⁵⁰ the lower the level of assets and future earning potential of a party, the greater the likelihood that losses will be externalized onto third parties and that judgment proofing will produce perverse incentives. This is one of the reasons that limited liability makes a strategy of externalization more effective. Limited liability can reduce the assets at risk (i.e., available to compensate victims) to a small fraction of investors' total net worth—the minimum amount that must remain invested in the business for the business to function.

Consider the example in section III.A.1 above. Suppose that the business only requires \$100 million of capital to function. With limited liability, investors can cap their losses in a

$$V_p - V_s = f_d \cdot -(a + m_d)$$

Thus the higher the likelihood of a downside scenario exceeding the assets of the investor, and the greater the extent to which the cost of the downside scenario exceeds the assets of the investor, the larger the expected transfer from third parties to the investor.

⁴⁹ Richard Squire calls this “correlation seeking.” Richard Squire, *Shareholder Opportunism in a World of Risky Debt*, 123 HARV. L. REV. 1151, 1152 (2010); Simkovic and Kaminetzky, *supra* note 36 at 214–18.

⁵⁰ I.e., holding constant the variance, mean, and other characteristics of the probability distribution.

downside scenario at \$100 million—the minimum assets required to run the business—rather than \$900 million—all of their assets. With limited liability, the expected value of the investment to investors increases from \$360 million to \$440 million (90% chance of \$500 million in the upside scenario, plus 10% chance of a loss of \$10 million in the downside scenario.

This \$80 million increase in value to the investor is not value creation—it is a pure change in the distribution of value. In expectation, this value is extracted from everyone in society other than the investors and transferred to the investors.

B. Risk aversion and diversification

A highly risk-averse private investor might not undertake this investment, notwithstanding the high private expected value, because even the relatively low chance of losing all of his assets (or a large proportion of his assets) might deter the investor more than the prospect of gains attracts him. In other words, risk aversion helps mitigate the judgment proof problem.⁵¹

However, excessive risk aversion could also deter socially beneficial investments. Risk aversion can be mitigated through legal devices that shield assets from judgments and enable investors to undertake risky investments without the possibility of complete loss of all of their assets and future income. These legal devices include: asset protection trusts, which shield assets placed within the trust from claims against the settlor or beneficiary of the trust;⁵² state law exemptions of certain property of individuals from collections by unsecured creditors; the Bankruptcy Code, which shields future income of individuals from collections by discharging most forms of indebtedness;⁵³ and limited liability, which shields investors' assets—other than those invested within a particular firm—from claims against the firms in which they invest.⁵⁴

Limited liability may be particularly prone to exacerbate the judgment-proof problem. This is because limited liability is extremely effective at shielding investors from the consequences of failure, especially when coupled with diversification, and can therefore more completely overcome risk aversion.⁵⁵

⁵¹ Shavell, *supra* note 24.

⁵² Stewart E. Sterk, *Asset Protection Trusts: Trust Law's Race to the Bottom*, 85 CORNELL L. REV. 1035, 1039 (1999).

⁵³ 11 U.S.C. §§ 523, 524, 727, 1141, 1228, 1328.

⁵⁴ Hansmann and Kraakman, *supra* note 26; Grundfest, *supra* note 35.

⁵⁵ There is a voluminous literature in portfolio theory dedicated to calculating the optimal amount of diversification (or ideal size of each individual investment as a share of total assets) when expected returns from each investment is positive but there is some chance of negative returns that could reduce the value of individual investments to zero but not below (i.e., liability for each investment is limited). See, e.g., LEONARD C. MACLEAN, EDWARD O. THORP & W. T. ZIEMBA, THE KELLY CAPITAL GROWTH INVESTMENT CRITERION: THEORY AND PRACTICE (2011); Michael Stutzer, *Portfolio Choice with Endogenous Utility: A Large Deviations Approach*, 116 J. ECONOMETRICS 365, 384 (2003); Nils H. Hakansson & William T. Ziemba, *Chapter 3: Capital Growth Theory*, 9 HANDBOOKS IN OPERATIONS RES. & MGMT. SCI. 65, 65 (1995); Nils H. Hakansson, *Capital Growth and the Mean-Variance Approach to Portfolio Selection*, 6 J. FIN. & QUANTITATIVE ANALYSIS 517, 526 (1971). This literature generally suggests that risk aversion can be managed and risk of ruin minimized by increasing diversification (reducing each individual investment as a share of assets) rather than avoiding high risk investments with high expected value.

Personal bankruptcy and legal defenses against creditors at state law entail unpleasant, time consuming, and potentially stigmatizing consequences for debtors, and will also typically substantially deplete their assets. Although the expected value *ex-ante* might be \$360 million (or in the example in III.A.2, \$440 million), the value *ex-post* could either be a gain of \$500 million or a loss that comes close to permanent financial ruin.

By contrast, consider an investor who diversifies by investing a relatively small portion of his assets in many different firms, each of which provides limited liability and takes risks that are uncorrelated with each other. Each investment is now like a separate roll of the dice, and thanks to limited liability, the unlimited gains and limited losses from each can be aggregated. By the law of large numbers, as the number of independent trials increases—i.e., the number of uncorrelated investments in different firms increases—the *ex-post* outcomes will increasingly approximate the *ex-ante* expected value.⁵⁶ In other words, a well-diversified investor will most likely encounter *ex-post* outcomes that will come close to \$440 million. In practice most investments will be at least partially correlated, so diversification cannot completely eliminate variance, but it can reduce it.⁵⁷

Returning to our example of the nuclear power plant, even a risk-averse investor with small stakes in thousands of different nuclear power plants, each organized as a separate limited liability entity, and each with a chance of disaster uncorrelated with the others, should prefer that *all* the nuclear plants skimp on maintenance to maximize profits in ordinary times and thus increase the chances that losses from each plant will be externalized onto third parties.

Diversification of investments is now virtually universal.⁵⁸ Costs and minimum asset requirements for diversification have virtually disappeared with the growth of indexed mutual funds,⁵⁹ and a “duty to diversify” is now firmly established in even conservative trust law.⁶⁰

C. Shareholder-centric corporate governance

Managers who are focused on maximizing returns to shareholders, cognizant of limited liability and diversification, should engage in risk taking that is excessive from the perspective of social welfare.⁶¹ By contrast, agency costs—managers pursuing their own interests

⁵⁶ P. L. Hsu & Herbert Robbins, *Complete Convergence and the Law of Large Numbers*, 33 PROC. NAT'L. ACAD. SCI. U.S.A. 25, 25–26 (1947); Harald Uhlig, *A Law of Large Numbers for Large Economies*, 8 ECON. THEORY 41, 41 (1996).

⁵⁷ Harry Markowitz, *Portfolio Selection*, 7 J. FIN. 77, 79 (1952).

⁵⁸ Ronald J. Gilson & Jeffrey N. Gordon, *The Agency Costs of Agency Capitalism: Activist Investors and the Revaluation of Governance Rights*, 113 COLUM. L. REV. 863, 865 (2013).

⁵⁹ Ajay Khorana & Henri Servaes, *What Drives Market Share in the Mutual Fund Industry?*, 16 REV. FIN. 81, 97 (2012). Total market index funds that offer exposure to thousands of firms—essentially the entire U.S. stock market—are now available for annual fees as low as 0.03% of assets, and with as little as \$1 to invest. See MUTUAL FUNDS: SCHWAB TOTAL STOCK MARKET INDEX FUND, SCHWAB.COM, <https://goo.gl/hMqmqx> (last visited Feb 9, 2018).

⁶⁰ John H. Langbein, *Questioning the Trust Law Duty of Loyalty: Sole Interest or Best Interest?*, 114 YALE L.J. 929, 970–71 (2005).

⁶¹ William W. Bratton & Michael L. Wachter, *The Case Against Shareholder Empowerment*, 158 U. PA. L. REV. 653–728, 658–659 (2010); Squire, *supra* note 49 at 1202; Hansmann and Kraakman, *supra* note 41 at 466–67.

ahead of shareholders—may mitigate excessive risk taking, because risk-averse managers cannot diversify their jobs as easily as shareholders can diversify their investments. Governance innovations such as incentive compensation that align managerial interests with shareholders and encourage greater risk-taking⁶² and a general shift toward a shareholder centric model of corporate governance⁶³ could exacerbate the judgment proof problem.

Bainbridge and Henderson argue that externalization problems could be mitigated by piercing the corporate veil for shareholders who specifically direct acts that lead to liability.⁶⁴ But corporate tendencies toward externalization do not require shareholders or senior managers to directly control decision-making. Externalization only requires that managers are provided strong incentives to behave in shareholders' best interests, for example by tying their compensation and job security to share price. Large shareholders may disproportionately invest in companies that take greater risks, generate larger short-term returns,⁶⁵ and pay larger dividends,⁶⁶ while withholding investment from companies that are managed more conservatively. Shareholders can influence executive compensation to align managerial interests more closely with their own.⁶⁷ While managers correctly infer their wishes, shareholders can avoid liability for decisions that are formally made by managers. Similarly, senior managers can delegate decision-making to more junior, possibly judgment-proof subordinates, reward performance that can only be achieved through risk externalization, and disclaim any knowledge or responsibility if problems subsequently materialize.⁶⁸

⁶² Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 323 (1976).

⁶³ Hansmann and Kraakman, *supra* note 41 at 440–41, 455.

⁶⁴ BAINBRIDGE AND HENDERSON, *supra* note 27 at 302-04.

⁶⁵ Aydoğan Alti, Ron Kaniel & Uzi Yoeli, *Why Do Institutional Investors Chase Return Trends?*, 21 J. FIN. INTERMEDIATION 694, 720 (2012); Geoffrey C. Friesen & Travis R. A. Sapp, *Mutual Fund Flows and Investor Returns: An Empirical Examination of Fund Investor Timing Ability*, 31 J. BANKING & FIN. 2796, 2797 (2007); Keith H. Black, *Returns-Chasing Behavior, Mutual Funds, and Beta's Death*, 33 CFA DIGEST 69, 70 (2003).

⁶⁶ Frank H. Easterbrook, *Two Agency-Cost Explanations of Dividends*, 74 THE AMERICAN ECONOMIC REVIEW 650, 650 (1984).

⁶⁷ Shawn Cole, Martin Kanz & Leora Klapper, *Incentivizing Calculated Risk-Taking: Evidence from an Experiment with Commercial Bank Loan Officers*, 70 J. FIN. 537–575, 542 (2015); Patrick Bolton, Hamid Mehran & Joel Shapiro, *Executive Compensation and Risk Taking*, 19 REV. FIN. 2139–2181, 2144 (2015); Alex Edmans & Xavier Gabaix, *The Effect of Risk on the CEO Market*, 24 REV. FIN. STUD. 2822–2863, 2822 (2011); Richard A. Posner, *Are American CEOs Overpaid, and, if so, What if Anything Should be Done about It*, 58 DUKE L.J. 1013, 1020 (2009); Frederick Tung, *Pay for Banker Performance: Structuring Executive Compensation for Risk Regulation*, 105 NW. U. L. REV. 1205, 1216 (2011); Patrick Bolton, José Scheinkman & Wei Xiong, *Executive Compensation and Short-Termist Behaviour in Speculative Markets*, 73 REV. ECON. STUD. 577–610, 598 (2006); Bo Becker, *Wealth and Executive Compensation*, 61 J. FIN. 379–397, 379 (2006); Jensen and Meckling, *supra* note 62.

Indeed, Robert Jackson argues that executive compensation and alignment of managerial and investor incentives is an important driver of Private Equity firms' success. Robert J. Jackson, *Private Equity and Executive Compensation*, 60 UCLA L. REV. 638, 646 (2012). Lucian Bebchuk and others have argued that senior executives at publicly traded companies can sometimes shape their own compensation to reduce alignment with shareholders, but executives might do so in ways that amplify their incentives to take risks. Lucian A. Bebchuk, Alma Cohen & Holger Spamann, *The Wages of Failure: Executive Compensation at Bear Stearns and Lehman 2000-2008*, 27 YALE J. ON REG. 257, 276 (2010); Kevin J. Murphy, *Explaining Executive Compensation: Managerial Power Versus the Perceived Cost of Stock Options*, 69 U. CHI. L. REV. 847, 862 (2002).

⁶⁸ John C. Coffee, ‘*No Soul to Damn: No Body to Kick*’: An Unscandalized Inquiry into the Problem of Corporate Punishment, 79 MICH. L. REV. 386, 457, 418, 433, 457 (1981); William S. Laufer, *Corporate Liability, Risk Shifting, and the Paradox of Compliance*, 52 VAND. L. REV. 1341, 1420 (1999); Justin Fox & Stuart V. Jordan, *Delegation and Accountability*, 73 J. POL. 831, 831 (2011).

The rise of diversification, shareholder empowerment, and corporate governance reforms may all help overcome risk aversion and encourage value-creating investments, but in combination with limited liability, they could also exacerbate the judgment proof and externalization problems.

D. Multiple periods, dividends, interest and salaries

In the real world, most businesses are not single period or two period affairs that are swiftly wound up with all gains or losses distributed to investors. Instead, businesses can persist for decades, in some cases outliving their initial investors. The accumulation of profits within a business would mitigate the advantages of externalization if such profits could be seized by claimants in the event of a subsequent disaster.

Limited liability facilitates risk externalization in part because it is possible to transfer profits and valuable assets from an entity that might face future liability to investors or employees who will be shielded and immune from such liability. If corporations retained all profits from their activities, during good years when positive outcomes materialized, corporations would build reserves which would then be available in bad years to satisfy any liability on judgments that might arise.⁶⁹

Investors can better externalize risks while investing in long-lived business entities if they have a mechanism that enables them to partition good years from bad. This is similar to reducing assets and increasing the variance of outcomes.

These mechanisms include dividend payments to shareholders, share repurchases,⁷⁰ interest payments to creditors, and (non-deferred) compensation to employees in excess of that which would be possible without limited liability. Routine payments, made while a company is apparently solvent (though engaged in risky activities), will rarely be questioned by courts.⁷¹ Legal challenges to such payments, such as fraudulent transfer or preference claims, succeed only rarely—usually when the payments are made on the eve of insolvency or under unusual circumstances implicating coercion, value-destruction or fraud.⁷²

Dividends, interest, and compensation—in combination with limited liability—create a one-way ratchet in which the benefits of risk-taking can flow to investors and key employees while the long-term costs can be externalized onto third parties.

⁶⁹ Steven L. Schwarcz, *The Inherent Irrationality of Judgment Proofing*, 52 STAN. L. REV. 1, 1,16, 18, 34 (1999) (identifying dividends or other transfers of value to investors as a critical step in judgment proofing); Donald Kehl, *The Origin and Early Development of American Dividend Law*, 53 HARV. L. REV. 36, 41 (1939) (“if limited liability was to survive, a rule against impairment of recent corporate capital by dividends or other repayments to stockholders was inevitable”); Steven A. Bank, *A Capital Lock-In Theory of the Corporate Income Tax*, 94 GEO. L.J. 889, 906-07 (2006).

⁷⁰ Stock repurchases resemble dividends in that they distribute corporate cash to shareholders. Compared to dividends, repurchases have different transaction costs, tax consequences, effects on executive stock options, and distributive consequences. Amedeo De Cesari et al., *The Effects Of Ownership and Stock Liquidity on the Timing of Repurchase Transactions*, 18 J. CORP. FIN. 1023, 1023 (2012); Jesse M. Fried, *Insider Signaling and Insider Trading with Repurchase Tender Offers*, 67 U. CHI. L. REV. 421, 421 (2000).

⁷¹ Susan Pace Hamill, *The Limited Liability Company: A Catalyst Exposing the Corporate Integration Question*, 95 MICH. L. REV. 393, 415–16 (1996).

⁷² Simkovic and Kaminetzky, *supra* note 36; Cook, *supra* note 36.

E. Beyond shareholders: creditors and counterparties

Many analyses of limited liability have focused on the limited liability of shareholders (equity holders).⁷³ Equity investors would not have limited liability if their business was operated as a general partnership or sole proprietorship, but can obtain limited liability protection if the business is organized as a corporation, limited liability company (LLC), limited partnership (LP), or limited liability partnership (LLP). Equity investors are also generally thought to be the risk-preferring residual claimants and owners of the company,⁷⁴ and therefore the most obvious beneficiaries of loss externalization through limited liability.⁷⁵ Therefore, classic analyses of limited liability and externalization such as those of Professors Henry Hansmann and Reinier Kraakman⁷⁶ and David Leebron,⁷⁷ as well as more recent efforts by Peter Conti-Brown,⁷⁸ have focused on ameliorating incentives to excessive risk taking by scaling back limited liability for shareholders.

However, there are other stakeholders whose liability is limited as a matter of course: creditors, managers/employees, and other contractual counterparties.⁷⁹ Compared to shareholders, these parties can often exert as much if not more control over corporate policy.⁸⁰ In addition, the return to debt instruments like high yield bonds and leveraged loans (as well as more complex convertible debt instruments) can closely mimic the return to equity.⁸¹ This has led many scholars to conclude that the debt-equity distinction is at best ambiguous and at worst untenable.⁸²

Professor Grundfest argues that even if limited liability for shareholders were unavailable, investors could easily obtain equity-like returns and limited liability.⁸³ They could do so through changes to capital structure (i.e., replacing equity with debt), financial engineering,

⁷³ Hansmann and Kraakman, *supra* note 26; Conti-Brown, *supra* note 38.

⁷⁴ Frank H. Easterbrook & Daniel R. Fischel, *Limited Liability and the Corporation*, 52 U. CHI. L. REV. 89, 91–92, 100 (1985); Richard A. Booth, *Limited Liability and the Efficient Allocation of Resources*, 89 NW. U. L. REV. 140, 148 (1994).

⁷⁵ Steven A. Bank, *A Capital Lock-In Theory of the Corporate Income Tax*, 94 GEO. L. J. 889, 896 (2006) (tracing the origins of the corporate tax as a benefit tax tied to special benefits such as limited liability and perpetual succession).

⁷⁶ Hansmann and Kraakman, *supra* note 26.

⁷⁷ Leebron, *supra* note 34.

⁷⁸ Conti-Brown, *supra* note 38.

⁷⁹ Lynn M. LoPucki, *The Essential Structure of Judgment Proofing*, 51 STAN. L. REV. 147, 148 (1998); Steven Shavell, *The Optimal Level of Corporate Liability Given the Limited Ability of Corporations to Penalize Their Employees*, 17 INTERNATIONAL REVIEW OF LAW AND ECONOMICS 203, 203 (1997). Sykes, *supra* note 34 at 1241.

⁸⁰ Douglas G. Baird & Robert K. Rasmussen, *Private Debt and the Missing Lever of Corporate Governance*, 154 U. PA. L. REV. 1209, 1209 (2006); Andrei Shleifer & Robert W. Vishny, *A Survey of Corporate Governance*, 52 J. FIN. 737, 751 (1997); G. Mitu Gulati, William A. Klein & Eric M. Zolt, *Connected Contracts*, 47 UCLA L. REV. 887, 887 (2000).

⁸¹ As noted above, managers with certain compensation structures may also have equity-like incentives that encourage greater risk taking and de facto limited liability.

⁸² Grundfest, *supra* note 35; Adam O. Emmerich, *Hybrid Instruments and the Debt-Equity Distinction in Corporate Taxation*, 52 U. CHI. L. REV. 118, 126 (1985); Katherine Pratt, *The Debt-Equity Distinction in a Second-Best World*, 53 VAND. L. REV. 1055, 1072 (2000); David A. Weisbach, *Line Drawing Doctrine and Efficiency in the Tax Law*, 84 CORNELL L. REV. 1627, 1644 (1999); Edward D. Kleinbard, *Stateless Income*, 11 FLA. TAX REV. 699, 730 (2011).

⁸³ Grundfest, *supra* note 35.

and the emergence of judgment-proof investors who would hold the small portions of the capital structure that carried risk of unlimited liability. Similarly, Professor LoPucki has argued that businesses can easily avoid tort liability by partitioning their operations between operating entities that take risks and separate entities that own assets.⁸⁴ The entities can organize their joint operations through contract rather than through shared ownership and corporate governance.

In addition, two empirical studies of transitions from unlimited to limited shareholder liability did not find much evidence of benefits redounding to shareholders.⁸⁵ This raises questions about the classic view that shareholders are the primary beneficiaries of limited liability. Just as the incidence of the corporate income tax probably does not fully fall on shareholders,⁸⁶ the incidence of limited liability may not exclusively benefit them.

As previously noted, shareholders are indifferent to the magnitude of losses exceeding the point at which the value of their investment falls to zero. Similarly, creditors are also indifferent to the magnitude of losses exceeding the point where the value of their own investment falls to zero, and to losses which can be externalized to other creditors or parties who have lower priority.

Consider a company that is financed with \$50 million of equity and \$50 million of debt. Shareholders will care about risks that reduce the value of the company from \$100 million to \$50 million. If this coincides with a default, equity's claim on the company may be extinguished and all value will then belong to the creditors. Creditors will care about risks that could reduce the value of the company from \$50 million to zero. But creditors will be indifferent to risks that could reduce the value of the company from \$0 to a negative value because all such losses will be externalized and fall on someone other than creditors.

Creditors are generally thought to be less risk-seeking than equity investors because creditors' upside is capped—the most they can gain is their principal and contractual interest payments.⁸⁷ However, a higher interest payment may be more than sufficient to compensate creditors for an extreme but unlikely risk, since creditors also enjoy limited liability. Investors who are creditors do not protect non-adjusting creditors because it is easy for shareholders and financial creditors to make a mutually beneficial deal in which they share the benefits of externalizing risks to third parties. If debt is already risky—that is, if debt has a high yield relative to the risk-free rate—then a shift toward greater risks (i.e., making unlikely but very negative outcomes more negative and relatively likely positive outcomes more positive) can also benefit creditors, even without an increase in interest rates.

High yield debt and leveraged loans are often sufficiently risky that they resemble equity. The limited liability of investors who structure their investment as debt rather than equity can pose similar problems with respect to exacerbating the judgment proof problem. Moreover, secured creditors' priority typically ensures that even if very negative outcomes materialize and the firm's liabilities exceed its assets by a wide margin, secured creditors will

⁸⁴ LoPucki, *supra* note 77 at 150; Schwarcz, *supra* note 67 at 9; Lynn M. LoPucki, *The Irrefutable Logic of Judgment Proofing: A Reply to Professor Schwarcz*, 52 STAN. L. REV. 55, 55 (1999).

⁸⁵ Weinstein, *supra* note 37; Weinstein, *supra* note 37. The first study is from California in the early 20th century and the second is of a single company in the 1960s, American Express, that was primarily financed with short-term debt. The results may not be fully generalizable to modern companies that may face more substantial tort liability. Interestingly, the empirical case for secured creditors benefiting by externalizing risks to tort claimants is also contested. Listokin, *supra* note 25.

⁸⁶ Li Liu & Rosanne Altshuler, *Measuring the Burden of the Corporate Income Tax Under Imperfect Competition*, 66 NAT'L TAX J. 215, 233 (2013).

⁸⁷ Simkovic and Kaminetzky, *supra* note 36 at 214–18.

recover the lion's share of whatever assets are available.⁸⁸ Indeed, impairing the rights of secured creditors arguably violates constitutional protections.⁸⁹

Even unsecured or subordinated creditors will not fully price many risks that could be externalized to third parties. Creditors will be largely insensitive to risks that will rarely materialize, but when they do materialize can be expected to exceed creditors' full investment and to therefore be externalized to third parties.⁹⁰ In other words, like equity holders who benefit from limited liability *entities*, creditors can walk away from very large losses thanks to prevailing *rules* that limit liability of creditors and contractual counterparties to the size of their investment.

Thus, limited liability benefits financial creditors and managers, not just shareholders. An approach that targets shareholders, rather than firms' beneficiaries more broadly construed, is ill-equipped to address the challenges of limited liability.

IV. How Big of a Problem?

How large are unknown risks and costs that companies may externalize? This question is inherently difficult to answer precisely because the risks are unknown. However, attempts to estimate the magnitude of externalization of *known* risks suggest that the problem could be substantial enough to merit additional policy interventions.

In the mid 1990s, CPA Ralph Estes sought to measure aggregate "social costs" of business enterprise, which Estes defined as costs imposed on society that are neither internalized nor accounted for by firms.⁹¹ Factoring in workplace injuries and accidents, medical expenses from unsafe products and health costs from pollution, Estes found that external costs to U.S. taxpayers totaled approximately \$2,618 billion in 1994 dollars.⁹² His analysis does not distinguish between corporate and noncorporate firms, but instead encompasses all business enterprise in the United States.⁹³ Adjusted only for inflation, this estimate in 2017 would be approximately \$4.4. trillion—which comes to more than 20 percent of U.S. GDP.

In reaching this number, Estes combined original research with "specific corporate social costs [that] have been estimated in a variety of contexts."⁹⁴ Estes does not purport to find a precise figure, but rather claims to reach a conservative estimate.⁹⁵ Estes's estimate of the

⁸⁸ Bebchuk and Fried, *supra* note 25 at 859; James Steven Rogers, *The Impairment of Secured Creditors' Rights in Reorganization: A Study of the Relationship between the Fifth Amendment and the Bankruptcy Clause*, 96 HARVARD LAW REVIEW 973–1031, 973 (1983); cf. Mark J. Roe & Frederick Tung, *Breaking Bankruptcy Priority: How Rent-Seeking Upends the Creditors' Bargain*, 99 VA. L. REV. 1235–1290, 1276 (2013) (discussing contested priority).

⁸⁹ Rogers, *supra* note 88.

⁹⁰ To be more precise, if scenario A and scenario B were equally likely, and Scenario A would completely wipe out unsecured creditors, while scenario B would completely wipe out unsecured creditors and cause massive harm to third parties as well, the difference in riskiness between Scenario A and Scenario B would not be reflected in market prices.

⁹¹ Ralph Estes, *The Public Cost of Private Corporations*, in TYRANNY OF THE BOTTOM LINE: WHY CORPORATIONS MAKE GOOD PEOPLE DO BAD THINGS 171–98 (1996).

⁹² *Id.* at 177–78.

⁹³ *Id.* at 172.

⁹⁴ Estes, *supra* note 89 at 172.

⁹⁵ *Id.* at 172.

public cost of private corporations includes four categories: (1) costs to workers; (2) costs to customers; (3) costs to communities; and (4) costs to the nation.⁹⁶

Within these categories, the largest costs are deaths from workplace cancer (\$274.7 billion), cost of price-fixing conspiracies, monopolies and deceptive advertising (\$1,166.1 billion), and health costs from air pollution (\$225.9 billion).⁹⁷ Estes argues that this estimate is conservative because only costs that are directly identifiable have been estimated, whereas other social costs, as well as secondary and multiplier effects, have generally been omitted.⁹⁸ Estes does not include the cost of serious poisonings from pesticides or the cost of psychological human suffering.⁹⁹

There are numerous methodological challenges with this approach—the estimates used come from both public and private sources via studies undertaken at different times, by different organizations and researchers, using different methodologies.¹⁰⁰ Estes' inclusion of monopoly pricing is perhaps stretching the definition of "externalization." However, 20 years later, Estes' study remains one of the most comprehensive and widely cited studies of aggregate externalization costs.

A more recent and less ambitious estimate from 1999 tabulates specific costs that add up to nearly \$900 billion in 2017 dollars.¹⁰¹ In 1999 dollars, these included health costs of \$53.9 billion a year from cigarettes, \$135.8 billion for the consequences of unsafe vehicles, \$141.6 billion for injuries and accidents from unsafe workplaces, and \$274.7 billion for deaths from cancers caused by toxic exposure in the workplace.¹⁰² In total and adjusting for inflation to 2017 dollars, these four product categories represent an estimated \$897 billion in externalization costs, or around 4 to 5 percent of GDP.

Even if Estes' estimate is too high by a factor of 5, it would still suggest that the magnitude of externalization is high enough to cancel out annual economic growth as measured by GDP.¹⁰³ This is a large enough problem to merit policymakers' attention.

Some might argue that limited liability only facilitates externalization when a company becomes insolvent. Because corporate insolvencies are relatively rare, this would seem to suggest that the role of limited liability in externalization is small. But this line of reasoning overlooks the role of *potential* insolvency and limits of successor liability in deterring plaintiffs. Actual insolvency is unnecessary for limited liability to facilitate loss externalization. The mere specter of liability pushing a firm to the brink of insolvency might persuade regulators, courts and plaintiffs to agree to lower damages, or forgo litigation altogether rather than expend resources seeking damages that would be uncollectible.¹⁰⁴

Companies' existence often ends with an asset sale rather than an insolvency. Following the asset sale, proceeds are distributed to target company investors and the target company dissolves. In most jurisdictions, asset purchasers do not take on successor liability. Nevertheless, cautious acquirers often use an acquisition subsidiary—which provides a liability shield to the parent company—to mitigate the risks of successor liability. Limited liability

⁹⁶ *Id.* at 173.

⁹⁷ *Id.* at 173.

⁹⁸ *Id.* at 173.

⁹⁹ *Id.*

¹⁰⁰ *Id.* at 173.

¹⁰¹ DAVID C. KORTEN, THE POST CORPORATE WORLD: LIFE AFTER CAPITALISM 46-83 (1999).

¹⁰² *Id.* at 48.

¹⁰³ Estes, *supra* note 89 at 173.

¹⁰⁴ See *supra* note 43.

reduces the risk of claimants injured by the target pursuing the acquirer of the target's assets. Thus, limited liability facilitates externalization even in the absence of corporate insolvency.

V. Previous Solutions and their Limitations

Several policy tools have been proposed to address the judgment proof problem when dealing with activities that are known *ex-ante* to be risky, including safety regulation, minimum asset requirements, and compulsory insurance.¹⁰⁵ These tools could arguably also be used to address the broader risk of externalization through limited liability, but each tool comes with limitations and may offer an incomplete solution. It is particularly difficult to use these tools to address risks that are unknown or unknowable. It is not always feasible to identify in advance which activities are risky.¹⁰⁶

A. Unlimited liability is limited by collection challenges

Providing for unlimited investor liability—in a way that would not be relatively easy for investors to circumvent and that would facilitate substantial recoveries—is challenging. Restricting limited liability seems attractive because retroactive assessments against investors could be proportionate to the damages caused and the risks taken. The level of risk and potential harm may be difficult to determine *ex-ante*, but easier to determine *ex-post*. As a practical matter, however, *ex-post* unlimited liability entails serious challenges of collections and enforcement. The prospect of unlimited liability could also exacerbate information problems and capital structure conflict among investors.¹⁰⁷ These challenges suggest that alternative (or supplemental) solutions to the judgment proof problem are needed.

B. Safety regulation is limited by regulators' knowledge of which activities are unsafe

Safety regulation is an attractive approach for managing risks when regulators have good information about the nature of the risks, precautions that can be undertaken to reduce those risks, and how the costs and benefits of various precautions compare to one another.¹⁰⁸ Regulation may be particularly attractive when regulators have specialized technical knowledge beyond that possessed by most private parties and economies of scale in acquiring and maintaining that knowledge.¹⁰⁹ In particular instances, however, private actors will often have better information than regulators about risk. When private actors have better

¹⁰⁵ Shavell, *supra* note 24 at 361; Steven Shavell, *Minimum Asset Requirements and Compulsory Liability Insurance as Solutions to the Judgment-Proof Problem*, 36 RAND J. ECON. 63–77, 63 (2005).

¹⁰⁶ Levitin, *supra* note 11 at 454.

¹⁰⁷ See *supra* notes 30 to 41 and accompanying text.

¹⁰⁸ Shavell, *supra* note 24; Levitin, *supra* note 11 at 439, 461–478 (describing challenges and limitations of *ex-ante* approaches to reducing systemic risk in financial and non-financial firms); Iman Anabtawi & Steven L. Schwarcz, *Regulating Ex Post: How Law Can Address the Inevitability of Financial Failure*, 92 TEX. L. REV. 75, 128 (2013).

¹⁰⁹ Shavell, *supra* note 24.

information than regulators, liability and other methods of internalizing costs might move us closer to the optimal risk levels.¹¹⁰

C. Minimum asset requirements reduce competition

Minimum asset requirements might inefficiently prevent parties with low assets from engaging in socially beneficial activities, and could inefficiently reduce entrepreneurship and competition.¹¹¹ While this side effect might not be particularly troubling if the policy were exclusively applied to activities known to be high-risk, applying minimum asset requirements more broadly whenever limited liability is utilized could have much larger economic consequences.

D. Insurance requires measurable risk and policing moral hazard

Compulsory insurance is attractive when it is possible for insurers to observe differences in risk levels and levels of care across insured parties and adjust the cost of insurance accordingly. Risk-adjusted premiums can affect both the decision about whether to engage in a risky activity and the level of care to take if engaging in the activity.¹¹² However, if premiums are not risk-adjusted, insurance can introduce moral hazard and adverse selection problems and blunt incentives to take precautions once insured.¹¹³

Mandatory insurance also does not eliminate the judgment proof problem, but rather shifts it up the chain to the insurance company.¹¹⁴ During the financial crisis of 2007-2009, several insurance companies who took on correlated mortgage risks, such as mono-line insurers and AIG, faced their own solvency challenges which ultimately led to post-hoc liquidity support from the federal government.¹¹⁵

In addition, private insurance is generally not readily available for unknown or unknowable risks. Insurers generally prefer to underwrite insurance for well-understood, specific and readily quantifiable risks for which historical data is available—that is, risks that resemble those that have materialized in the past.¹¹⁶

¹¹⁰ *Id.*

¹¹¹ Shavell, *supra* note 105 at 64–65, 74. The problem is more severe when the ability to raise capital is constrained, for example because of information problems or other frictions in the capital markets.

¹¹² Omri Ben-Shahar & Kyle D. Logue, *The Perverse Effects of Subsidized Weather Insurance*, 68 STAN. L. REV. 571 (2016).

¹¹³ Shavell, *supra* note 105 at 64–65.

¹¹⁴ Boardman, *supra* note 4 at 806, 807, 809, 812.

¹¹⁵ Squire, *supra* note 49; Michael Simkovic, *Competition and Crisis in Mortgage Securitization*, 88 IND. L.J. 213, 213 (2013); Robert P. III Bartlett, *Inefficiencies in the Information Thicket: A Case Study of Derivative Disclosures during the Financial Crisis*, 36 J. CORP. L. 1, 15 (2010); Michael Simkovic, *Secret Liens and the Financial Crisis of 2008*, 83 AM. BANKR. L.J. 253, 283–89 (2009).

¹¹⁶ Howard Kunreuther & Mark Pauly, *Insuring Against Catastrophe*, in THE KNOWN, THE UNKNOWN, AND THE UNKNOWABLE IN FINANCIAL RISK MANAGEMENT: MEASUREMENT AND THEORY ADVANCING PRACTICE 210, 211 (Francis X. Diebold, Neil A. Doherty, & Richard J. Herring eds., 2010); Boardman, *supra* note 4 at 784.

VI. *Limited Liability as Information-Forcing Mechanism*

The externalization problem can be mitigated through existing mechanisms such as regulation, mandatory insurance, and minimum capital requirements—but only to the extent that risks are well-understood by policymakers. When risks are unknown or unknowable, all of the extant policy levers for addressing risk externalization are incomplete, have potentially undesirable side effects when applied broadly, or perform poorly.

Policymakers typically will not understand industry-specific risks as well as private businesses. Mechanisms to mitigate externalization could be more effective if information asymmetries between industry and policymakers could be reduced.

A charge for limited liability entities, (even if only crudely) calibrated to risk levels, could have two salutary effects. First, a well-calibrated limited liability tax could help compensate the public fisc for risks and reduce externalization.¹¹⁷ Second, a limited liability tax could force private industry actors to reveal information to policymakers and regulators, thereby dynamically improving the public response.

Because private businesses will typically have better information about industry-specific risks than policymakers, charging firms for limited liability will lead private firms to sort themselves by riskiness and reveal information to policymakers. In industries where risks are high relative to the costs of limited liability, many firms will opt to pay for limited liability; whereas in industries where risks are low, relatively few firms will elect limited liability.

Policymakers will then be able to focus their attention on the industries that have self-identified as high risk and develop more finely tailored regulatory responses. Because the benefits of making the proper election are fully internalized by individual firms, whereas the costs of future regulation or limited liability tax changes will be borne collectively, firms will be unlikely to strategically mislead policymakers through their elections.

By helping to reveal private information and focus regulators' attention, a limited liability tax could accelerate the pace at which policymakers learn and therefore the pace at which regulations improve. Over time, a given risk that was once unknown will become increasingly familiar, identifiable, measureable, predictable and ultimately possible to regulate or insure.

A. *Dynamic, iterative pricing of the unknown*

The goal of a limited liability tax is to target risks of harm that may be externalized to third parties. Pricing the unknown is inherently challenging, particularly when regulators and tax authorities have far less information than industry participants and sophisticated investors.

Conventional approaches to measuring risk used in finance and the asset pricing litera-

¹¹⁷ As discussed below, the extant corporate income tax is not well-calibrated to risk of externalization. Nor is the corporate income tax truly a tax on limited liability, in light of opportunities to enjoy limited liability without paying corporate income taxes.

ture are of limited usefulness because these measures are meant to assess risk *to investors*—either shareholders or creditors—who enjoy limited liability.¹¹⁸ When investors enjoy limited liability, they will only consider risks up to the value of their investment, not risks of harm that can be externalized to the general public.¹¹⁹ The fact that risks are not known and are not precisely quantifiable does not mean that nothing should be done to address them. We can safely assume that the costs of externalized risks—and the commensurate benefits to investors and employees—are greater than zero. Thus, even a modest countervailing policy could be an improvement over the status quo.

Industry participants' choices to pay the proposed fee for limited liability or forgo protection will reveal information to policymakers and regulators about knowledgeable parties' internal assessments of risk.

When limited liability comes at a cost, those who believe that they are engaged in more risky activities will be more likely to opt into limited liability, while those who believe their actions are comparatively benign will be more likely to forgo it.¹²⁰ If limited liability were priced uniformly relative to scale, then variation in the proportion of similar firms that opted into limited liability would reveal information about private assessments of the relative riskiness of various activities. Assume risks are nearly uniform within a group of similar firms, but information about risk and perceptions of risks still vary among members of the group.¹²¹ Thus, elections regarding limited liability aggregate and reveal information about risk, much as market pricing or prediction markets aggregate and reveal information.¹²² Regulators could use this information to more closely study and eventually regulate or insure high-risk activities.

Regulators could also iteratively reprice limited liability in subsequent periods, charging different prices to different risk-pooled groups of firms based on information revealed in the previous period. Thus, a risk-uniform group in which relatively few or no firms opted into limited liability in the previous period—thereby signaling relatively low risk for the group—would see the price of limited liability fall in the next period. On the other hand, a risk-uniform group in which a very large proportion of firms opted into limited liability—thereby signaling relatively high risk—would see the price of limited liability increase in subsequent periods. Limited liability during each period would cover harm arising out of activities undertaken during the period. Because the benefits of making the proper election are fully internalized by individual firms, whereas the costs of future regulation or limited liability

¹¹⁸ For example, some scholars have proposed that courts and regulators use market indicators of risk such as credit spreads to detect risks that have not yet materialized and are not readily observable. Oliver Hart & Luigi Zingales, *A New Capital Regulation for Large Financial Institutions*, 13 AM. LAW ECON. REV. 453–490, 487–88 (2011); Simkovic and Kaminetzky, *supra* note 36 at 166–68.; Michael Simkovic, *Making Fraudulent Transfer Law More Predictable*, in *HANDBOOK ON BANKRUPTCY* (Barry E. Adler ed., 2018), <http://ssrn.com/abstract=2775920>; Michael Simkovic, *The Evolution of Valuation in Bankruptcy*, 91 AM. BANKR. L.J. 301, 307 (2017). Markets, imperfect though they may be, tend to be better at aggregating information and predicting the future than many alternatives. However, credit spreads and other financial market-based indicators of risk can account for risks only to the extent that those risks would be borne by creditors or other investors.

¹¹⁹ See discussion *supra* in section III.E., notes 86 to 90 and accompanying text. Market participants focus only on their own bottom line and not externalities. Robert K. Rasmussen & David A. Skeel Jr, *The Economic Analysis of Corporate Bankruptcy Law*, 3 AM. BANKR. INST. L. REV. 85, 94 (1995).

¹²⁰ Ayres and Gertner, *supra* note 19 at 98–100; Raskolnikov, *supra* note 19 at 691.

¹²¹ In other words, risks are uniformly distributed within each group, but perceptions of risk are non-uniformly distributed. A simplifying assumption would be that such information is normally distributed.

¹²² Grossman, *supra* note 21; Gilson and Kraakman, *supra* note 21; Wolfers and Zitzewitz, *supra* note 21.

tax changes will be borne collectively by the group (i.e., competitors within an industry), firms will be unlikely to strategically mislead policymakers through their elections.¹²³

When prices are set such that similar firms are close to equally likely to choose limited liability or forgo it, we can infer that the cost of limited liability is priced roughly at its value.¹²⁴ At this point, differences in the price of limited liability for different categories of firms would be a good indicator of differences in residual risk that was known or suspected by industry participants, but unknown to regulators or the public.

Regulators may be able to risk-pool firms only imperfectly; firms within a group will inevitably be less than perfectly uniform. But this too, can be an information-forcing mechanism that could lead to dynamic improvements over time. Low-risk firms that are mistakenly grouped with high-risk firms have incentives to reveal industry-specific information that can help regulators and policymakers better distinguish between high risk and low risk firms.

Costly, rather than costless, limited liability could thereby pressure industry to share information with the public through firms' choice between limited liability and higher taxes. By helping to reveal private information and focus regulators' attention, a limited liability tax could accelerate the pace at which policymakers learn and therefore the pace at which regulations improve.

Whatever price is initially implemented for a limited liability tax will divide the population of taxpaying businesses into three groups: (1) those for whom the tax is lower than the perceived value of limited liability, and who therefore will choose a limited liability entity and pay the tax; (2) those for whom the tax is higher than the value of limited liability, and who will therefore do business without the benefits of limited liability (but perhaps with more private insurance than they would otherwise use); and (3) those for whom the tax is higher than the value of limited liability, and who will refuse to do business without the benefits of limited liability. The decision by Group 3 firms to not do business will likely improve efficiency by shutting down socially harmful firms.¹²⁵

There will be a margin for error in pricing where taxpayers are risk averse, because the value risk-averse taxpayers place on limited liability will be higher than the cost to the government of providing limited liability (i.e., the cost of absorbing additional externalized losses), just as the insured value insurance more than it costs the insurance company to provide it. If policymakers believe that investors are risk averse and that private insurance is

¹²³ Collusion becomes more plausible if the group is very small and/or the industry is highly consolidated.

¹²⁴ If we assume some risk aversion, then the optimal price may be one at which more than half of firms are likely to choose limited liability, though not all. If all firms chose limited liability, that would be a clear sign that limited liability is underpriced.

¹²⁵ This is likely as long as investors are either not risk averse or the firm or its investors can seek private insurance as an alternative to limited liability. If investors are risk neutral or risk seeking and have decided that a business does not make sense—whether they pay for limited liability or forgo it—then the business is likely socially harmful and should not operate. Thus, shifting some businesses into Group (3) will increase efficiency by shutting down socially harmful businesses.

However, if Group (3) firms' investors are risk averse, then Group (3) firms or their investors could seek private insurance in lieu of limited liability. Only if all private insurance companies were unwilling to insure risks at lower cost than the government—and were all mistaken in this decision—would over-charging for limited liability create a deadweight loss. To obtain private insurance, firms would likely have to be extremely specific about *which* risks they wished to insure and would therefore need to reveal information to private insurance companies. Investors would also have to feel confident that risks would be below insurance coverage limits and that the insurance company could remain solvent. These are serious shortcomings, but private insurance could nevertheless provide a less expensive—and less attractive—alternative to limited liability which could mitigate the danger of the government overcharging for limited liability.

unavailable because private insurance companies are also irrationally risk averse, then the optimal proportion of firms electing limited liability would be more than half. (The optimal proportion would be larger depending on the degree of investor risk aversion assumed.)

The limited liability tax could improve on the status quo for both groups (1) and (2) by forcing them to internalize more costs and providing fewer opportunities for externalization. Group (1) will internalize part of the cost by paying a tax, while Group (2) will internalize costs by paying more in judgments. Taxpayer choices about which group to join can convey important information to regulators.

If firms choose to transition between limited liability and unlimited liability between periods, investors in transitioning firms may seek to liquidate their positions. Changes in the market price of firms would also reveal information about investors' assessments of risk. This approach might put pressure on the agency relationship between managers and investors. Managers might have incentives to either exaggerate or understate externalization risks, depending on their own levels of risk aversion. Nevertheless, U.S. corporate and securities laws and sophisticated investors generally are effective at monitoring managers, aligning their interests with investors, and policing agency costs. Corporate law is a strong enough pillar to support risk discovery.

Thus, the limited liability tax is an information-forcing mechanism that encourages businesses to publicly reveal private information about the risks of externalization inherent in their businesses.¹²⁶ Lawmakers and regulators and insurers can therefore focus more of their attention on Group (1) entities that have identified themselves as high-risk.¹²⁷ While the limited liability tax will be mispriced at any given point in time, it can accelerate the risk discovery process. Thus, it will increase dynamic efficiency and provide long-term benefits.

B. Choosing a tax base to scale firms

The iterative approach to taxing limited liability outlined above requires that similar firms be grouped together. To help form larger groups, it is helpful to scale limited liability tax rates by firms of different size to arrive at different tax liabilities. If two firms are engaged in activities that are similarly risky, but one firm's activities are more extensive, the more firm engaged in more extensive activities should pay more in tax. This is fundamentally a question of the appropriate tax base. For reasons explained in greater detail below, the appropriate measure of activity, and therefore the appropriate tax base, is probably the greater of revenue or expenditures.

The most obvious correlate of externalization risk is probably size or activity level. All else being equal, a larger business enterprise, more actively engaged in the economy, is likely to produce larger losses in a downside scenario than a much smaller, less active enterprise.

¹²⁶ Raskolnikov, *supra* note 19 (proposing information forcing and self-sorting mechanisms in tax enforcement).

¹²⁷ Regulatory focus on specific individual firms that opted into limited liability would likely be priced into individual firms' decisions about entity selection. However, if regulators and insurers noted the mix of firms that opted into limited liability versus unlimited liability by industry or activity type, and increased policing and monitoring of those industries and activities across entity types, collective action problems would preclude too much gamesmanship by firms with respect to entity selection.

Larger aggregate losses are probably more likely to lead to government intervention than smaller ones (although a network of small enterprises engaging in similar activities could in aggregate generate large externalized losses).

1. *The greater of revenue or expenditures*

Revenue has many advantages as a measure of size and economic activity. Revenue reflects the value that the market is willing to pay for the total output of a firm on an annual basis. In the absence of specific information that certain activities are riskier per unit of revenue, revenue seems like a sensible starting place for sizing risk. Unlike profit and income, revenue does not depend on capital structure—regardless of the mix of debt or equity, revenue remains constant. Unlike income, revenue is not easy to alter through simple accounting manipulations, such as characterizing certain cash outlays as current expenses or disguising dividends or personal consumption as business expenses.¹²⁸

Indeed, revenue sharing agreements have often been used to coordinate activity across firms in a supply chain.¹²⁹ Some analyses suggest that revenue sharing could have advantages over profit sharing in many contexts.¹³⁰

Some scholars have also argued that a heavy income tax does not discourage risk taking as long as there are full loss offsets and taxpayers can adjust their portfolios in response to the tax.¹³¹ A revenue tax, unlike an income tax, does not feature loss offsets of any kind. Therefore, it may be sensible to structure a limited liability tax as a percentage of the revenue of any entity that confers limited liability on its investors.

However, firms will only have revenue if they have customers. Firms might undertake risky investment activities in early stages when they have no revenue. For such firms, cost may be a better measure of size of economic activity. Therefore, the greater of revenue or cost may be the best available tax base.

Several measures of size are often used in accounting and finance studies: revenue, number of employees, value of assets, or possibly firm value (e.g., enterprise value).¹³² An explanation of why other tax bases are less desirable follows.

¹²⁸ Hamill, *supra* note 71 at 415–19 (discussing closely held corporations’ generally successful attempts to bring taxable corporate income down to close to zero by boosting deductible expenses).

¹²⁹ Gérard P. Cachon & Martin A. Lariviere, *Supply Chain Coordination with Revenue-Sharing Contracts: Strengths and Limitations*, 51 MGMT. SCI. 30, 31 (2005).

¹³⁰ David E. M. Sappington & Dennis L. Weisman, *Revenue Sharing in Incentive Regulation Plans*, 8 INFO. ECON. & POL’Y 229, 232–35 (1996).

¹³¹ J. E. Stiglitz, *The Effects of Income, Wealth, and Capital Gains Taxation on Risk-Taking*, 83 Q. J. ECON. 263–283, 263 (1969); David Weisbach, *Taxation and Risk-Taking with Multiple Tax Rates*, 57 NAT’L TAX J. 229–43, 229 (2004); John R. II Brooks, *Taxation, Risk, and Portfolio Choice: The Treatment of Returns to Risk under a Normative Income Tax*, 66 TAX L. REV. 255, 255–56 (2012) (arguing that full portfolio adjustments are unlikely and an income tax will reduce risk taking); Mitchell A. Kane, *Risk and Redistribution in Open and Closed Economies*, 92 VA. L. REV. 867–928, 867–70 (2006).

¹³² S. S. Shalit & U. Sankar, *The Measurement of Firm Size*, 59 REV. ECON. & STAT. 290, 294 (1977); Osamah M. Al-Khazali & Taisier A. Zoubi, *Empirical Testing of Different Alternative Proxy Measures for Firm Size*, 21 J. APPLIED BUS. RES. 79, 79 (2011).

None of these size measures typically determines corporate tax liability. Instead, corporate tax liability rises with taxable income, which roughly corresponds to corporate profit.

2. Income or profit

The corporate income tax is often understood as a withholding tax necessitated by the impracticality of collecting against individual investors,¹³³ but it is not tied to limited liability nor is it well calibrated to risk levels.¹³⁴ There is no particular reason to believe that a firm that is more profitable, and therefore has a higher income, is more active or engaged in greater risk-taking activities than firms that are less profitable or run at loss. Income is therefore not the appropriate tax base.

Profit is not a very good measure of firm size because very large companies can have low profits or operate at a loss. For purposes of measuring risk of externalized losses, low profits or operating losses in one year do not seem to necessarily suggest lower long-term risk levels. Although profits can often be increased by expending less on risk-mitigating measures, profits are influenced by many factors; higher profits do not necessarily suggest higher long-term risk levels.¹³⁵

For purposes of the extant corporate income tax, net income or profits can be reduced substantially without changing operations by recapitalizing the company—replacing equity with debt and dividends with interest payments. For practical purposes, the two forms of capital may be close to functionally equivalent, and there do not seem to be strong reasons to believe that more highly levered firms have lower risks of externalizing losses.¹³⁶ To the contrary, a firm with more secured debt may be more capable of externalizing losses because secured creditors have higher priority claims on assets of the firm than tort claimants and other involuntary creditors.¹³⁷ Thus a tax tied to corporate income, as conventionally defined under the internal revenue code, will not be a good proxy for risk.

Another widely used proxy for risk is earnings variability.¹³⁸ The intuition is that earnings are likely to track cash flow and that greater swings on the upside imply the potential

¹³³ Bank, *supra* note 25; Reuven S. Avi-Yonah, *Corporations, Society, and the State: A Defense of the Corporate Tax*, 90 VA. L. REV. 1193, 1201 (2004).

¹³⁴ Avi-Yonah, *supra* note 133 at 1206.

¹³⁵ William R. Gebhardt, Charles M. C. Lee & Bhaskaran Swaminathan, *Toward an Implied Cost of Capital*, 39 J. ACCT. RES. 135, 154 (2001) ("Interestingly, while investors appear to demand a higher risk premium for stocks with greater earnings variability, in general, these stocks earn lower returns *ex post*").

¹³⁶ Mark Roe, *Brown-Vitter cannot fix US banks by itself*, FINANCIAL TIMES, May 15, 2013, <http://www.ft.com/intl/cms/s/0/3d9f5954-bd51-11e2-a735-00144feab7de.html#axzz3ptl4pgzm> (last visited Oct 28, 2015) ("the US corporate tax system is perversely biased towards debt and against equity. It allows for tax deductions of debt interest payments while taxing shareholder profits"); Jensen and Meckling, *supra* note 62 (arguing that the presence of debt can encourage greater risk taking by equity holders to extract value from bondholders through "asset substitution"); cf. Hayne E. Leland, *Agency Costs, Risk Management, and Capital Structure*, 53 J. FIN. 1213–1243, 1237 (1998) ("agency costs of debt related to asset substitution are far less than the tax advantages of debt"). cf. Hayne E. Leland, *Agency Costs, Risk Management, and Capital Structure*, 53 J. FIN. 1213, 1237 (1998) ("agency costs of debt related to asset substitution are far less than the tax advantages of debt").

¹³⁷ Baird, *supra* note 34 at 1429–31; cf. Listokin, *supra* note 25 at 1067–68 (finding that finding that secured debt is used primarily to reduce agency costs and not to redistribute value from tort claimants).

¹³⁸ Gebhardt, Lee, and Swaminathan, *supra* note 135 at 146, 154 ("Financial practitioners often regard the variability of reported earnings as a source of risk for firm valuation . . . In addition, earnings variability is likely to capture fundamental cash flow risk . . . Results based on all three measures of earnings variability indicate that investors demand a higher risk premium for stocks with higher earnings variability . . .").

for greater swings on the downside.¹³⁹ Very large downside swings could create opportunities for risk externalization.

A traditional corporate income tax generally does not tax businesses with more volatile earnings much more heavily than those with more consistent earnings because of opportunities to smooth taxable income, for example by carrying back or carrying forward net operating losses.¹⁴⁰ Although not all losses are usable, most are.¹⁴¹ With full offsets of losses, the federal government is effectively a partner in risk-taking,¹⁴² and the corporate income tax will not do much to discourage excessive risk-taking resulting from limited liability.

By contrast, a limited liability tax structured so that firms cannot offset losses would fall more heavily on businesses engaged in riskier activities. All else being equal, these might also be the businesses with the greatest risk of externalizing losses to the public fisc.¹⁴³ Thus a revenue tax without loss offsets might be preferable for a limited liability tax.

It should be noted that the extant corporate income tax *is not* a tax on limited liability calibrated to the risk of externalization. Limited liability for owners is currently available without corporate taxes for firms using certain structures that are typically practical only when there are few owners.¹⁴⁴ These structures include S-Corporations, privately held LLCs and privately held partnerships.

If an LLC or a partnership becomes publically traded, the firm can more readily access capital from many investors, each of whom need only contribute a small fraction of his or her assets. The cost of such access to capital is that these entities are generally subject to corporate taxation. However, there are exceptions for publically traded LLCs and partnerships engaged in certain activities. Many of these exempt activities—real estate, energy, and natural resource extraction and transportation—could be high-risk.¹⁴⁵

¹³⁹ John R. II Brooks, *Taxation, Risk, and Portfolio Choice: The Treatment of Returns to Risk under a Normative Income Tax*, 66 TAX L. REV. 255, 258–59 (2012) (discussing the traditional view of variance as a proxy for risk and alternate conceptions of risk that are more focused on potential losses rather than volatility).

¹⁴⁰ Mark Campisano & Roberta Romano, *Recouping Losses: The Case for Full Loss Offsets*, 76 NW. U. L. REV. 709, 715–16 (1981); Jacob Nussim & Avraham Tabbach, *Tax-Loss Mechanisms*, 81 U. CHI. L. REV. 1509, 1511–18 (2014).

¹⁴¹ Michael Cooper & Matthew Knittel, *Partial Loss Refundability: How Are Corporate Tax Losses Used?*, 59 NAT'L TAX J. 651, 651–52 (2006).

¹⁴² Mitchell A. Kane, *Risk and Redistribution in Open and Closed Economies*, 92 VA. L. REV. 867, 869–70 (2006).

¹⁴³ Because greater volatility over a limited range of risk could also suggest greater likelihood of more extreme losses.

¹⁴⁴ The corporate income tax is imposed on C-Corporations and publically traded partnerships and LLCs, but not on closely held S-Corporations or partnerships or LLCs that are not publicly traded. Hamill, *supra* note 71 at 394, 397–398, 410, 413, 421 fn.137, 423–24; Bank, *supra* note 69. I.R.C. § 7704(a)&(b) (publicly traded LLCs and partnerships taxed as corporations); Eric B. Sloan & Matthew W. Lay, *Beyond the Master Limited Partnership: A Comprehensive Review of Publicly Traded Partnerships*, 88 TAX MAG. 229, 229–30 (2010).

¹⁴⁵ There are numerous exceptions under I.R.C. § 7704 for publicly traded partnerships engaged in certain kinds of activities, or multilayer entities including real estate investment trusts, regulated investment companies, and oil and gas and other mineral extraction activities. Sloan and Lay, *supra* note 144 at 232, 243.; I.R.C. § 7704(c)&(d). The latter exception may be ironic given widespread beliefs that extractive industries that increase greenhouse gas emissions have opportunities to externalize losses. Thomas W. Merrill & David Schizer, *The Shale Oil and Gas Revolution, Hydraulic Fracturing, and Water Contamination: A Regulatory Strategy*, 98 MINN. L. REV. 145, 148–49 (2013).

3. *Number of employees*

Number of employees is not an ideal measure because some industries are more capital intensive or have higher output per employee than others.¹⁴⁶

4. *Assets*

Value of assets is also not a great measure of firm size for purposes of estimating riskiness because a firm can use its assets more or less intensively in ways that generate risk of losses that can be externalized. All else being equal, a high-asset firm probably has a lower chance of externalizing risk because of the availability of a larger pool of assets to satisfy claimants.¹⁴⁷

5. *Firm value*

Firm value or equity values are also imperfect measures of size for purposes of estimating risk. The benefits of externalizing risk to parties other than shareholders may be reflected in equity value. However, equity value is a noisy signal and could reflect many other factors such as expectations of future growth and profitability.¹⁴⁸

C. *Signal vs. noise*

This section considers noise that could contaminate our signal. What factors—other than investors' and managers' perceptions of risks that limited liability would enable them to externalize—could influence firms' elections between limited liability and higher taxes?

1. *Investor wealth*

One concern is heterogeneity in investor wealth levels. Legal protections that limit liability are most valuable to those who have the most assets to lose. Because these investors' assets are sufficiently large, recoveries may be high relative to collection costs. Legally created limited liability is not worth as much to those who have natural immunity by virtue of owning essentially nothing of value.

Thus, wealthier investors may value limited liability more highly. On the other hand, wealthier investors are also likely to be more risk-tolerant. Thus, variation among investors in risk aversion may help offset variation in the value of limited liability.

There seems to be little reason to believe that investor wealth would vary systematically among firms in different industries or engaged in different sorts of activities. Thus, differences in investor wealth may simply wash out. However, if investor wealth does vary across groups of firms, the greater value of limited liability to investors with higher wealth levels could result in a limited liability tax operating in part as an inadvertent progressive wealth tax. On the other hand, the impact on wealthy investors could diminish over time if

¹⁴⁶ Number of employees might be useful in conjunction with other measures, particularly where concerns about manipulation of less transparent, self-reported measures might arise.

¹⁴⁷ Shavell, *supra* note 105.

¹⁴⁸ TIM KOLLER ET AL., VALUATION: MEASURING AND MANAGING THE VALUE OF COMPANIES (2005).

information generated by a limited liability tax results in new regulations and mandatory insurance regimes that erode judgment-proof investors' cost advantages.

2. *Risk aversion*

Corporate governance will be a product of investor preferences, managerial preferences, and each group's relative degree of control. Greater risk aversion should be associated with lower risk of externalization, because risk averse parties will fear the losses they might incur in a downside scenario more than they value actuarially equivalent gains in an upside scenario. However, risk-averse investors will also value limited liability more than risk-neutral investors and therefore be more willing to pay for it, even at a lower risk level. If investor risk aversion consistently varies across categories of firms, this could introduce noise affecting the signal created by firms' elections.

As discussed above, fully-diversified investors are often assumed to be risk neutral with respect to firm-specific risks, while investors who are not diversified and have a larger share of their wealth at risk in one investment may be more risk averse. All else being equal, this may suggest that structures that facilitate diversification—like publicly tradable and widely-held ownership interests—tend to increase the risk of externalized losses by making investors more risk-preferring. By contrast, investors in smaller, closely held companies with a small number of investors, each of whom have a large portion of their wealth tied up in the business, may be more risk averse.

However, it is not necessarily the case that smaller, closely held firms are managed more conservatively than larger firms. The investors and managers of smaller firms may have sufficiently high assets that they can diversify even while making large illiquid investments in individual firms. Or they may be risk-seeking.¹⁴⁹ Among investors, those with higher levels of income and wealth are generally assumed to be more tolerant of risk,¹⁵⁰ and also likely to benefit more from limited liability than less wealthy investors who are more likely to be judgment proof.

In the absence of strong evidence about a relation between business entity and risk of externalized losses, the most sensible approach may be to tax equally regardless of business entity, as long as an entity confers limited liability. Thus, unlike the extant corporate income tax, a limited liability tax would also apply to LLCs, S-Corporations, LLPs, and LPs.

3. *Agency costs*

Publicly traded companies with diversified investors might not be run in a riskier fashion than smaller, closely held companies because of greater agency costs. Managers are often assumed to be more risk averse than investors because managers cannot diversify their employment in the same way that investors can diversify their investments.¹⁵¹ Dif-fuse ownership structure likely makes it more challenging for shareholders to play a large

¹⁴⁹ Robert E. Hall & Susan E. Woodward, *The Burden of the Nondiversifiable Risk of Entrepreneurship*, 100 AM. ECON. REV. 1163, 1184–85 (2010).

¹⁵⁰ Terrence A. Hallahan, Robert W. Faff & Michael D. McKenzie, *An Empirical Investigation of Personal Financial Risk Tolerance*, 13 FIN. SERV. REV. 57, 58–59 (2004).

¹⁵¹ John Armour & Jeffrey N. Gordon, *Systemic Harms and Shareholder Value*, 6 J. LEGAL ANALYSIS 35, 36–36 (2014).

role in governance. In the absence of shareholder pressure, managers may be likely to take fewer risks than would be optimal for shareholders.¹⁵²

Incentive compensation tied to share price can be used to align managerial interests more closely with shareholders, overcome agency costs, and increase corporate risk taking.¹⁵³ If incentive compensation aligned managerial and shareholder interests, then firms would likely make the optimal election with respect to the limited liability tax.¹⁵⁴ If agency costs cause firms to behave as if they were risk averse, then the optimal proportion of firms electing limited liability (i.e., the proportion that suggests limited liability is appropriately priced) will be more than half.

4. Capital structure

Capital structure will be largely irrelevant to the election as long as both the limited liability tax and the alternative—unlimited pro-rata liability—are both insensitive to firms' choice of capital structure. Revenue, unlike income, does not depend on capital structure. If pro-rata unlimited liability is extended from shareholders to holders of warrants and financial creditors, then unlimited liability will also be insensitive to capital structure. However, if unlimited liability only applied to shareholders, then efforts to evade unlimited liability through financial engineering and changes in capital structure could present challenges.¹⁵⁵

5. Positive externalities and innovation

Would taxing limited liability disproportionately discourage firms that generate positive externalities and innovation? This seems unlikely, unless positive and negative externalities were highly correlated—in which case there might be no net-externalities to worry about in the first place. The risk of externalization is not necessarily greater for more innovative firms. Even in ostensibly mature industries, new scientific knowledge related to risk is continuously discovered.¹⁵⁶

Limited liability is most attractive to those who expect to be found liable, presumably because they are funding activities they believe are potentially dangerous to other people.

¹⁵² Bank, *supra* note 69 at 893 (describing managerial preferences to retain earnings and lock in a stable source of capital).

¹⁵³ Jensen and Meckling, *supra* note 62. Such incentive compensation is explicitly encouraged under the internal revenue code. For example, pay to top executives above \$1 million is only deductible with respect to corporate taxes if that pay is in the form of incentive compensation tied to stock price. I.R.C. § 162(m).

¹⁵⁴ Bratton and Wachter, *supra* note 61. Some scholars now worry that incentive compensation might lead to risk taking that is excessive even from the perspective of risk-tolerant shareholders, because corporate executives are selected in part for their boldness and willingness to pursue risky growth strategies, and incentive compensation that is high enough may be worth the possible loss of a salaried position. Bolton, Mehran, and Shapiro, *supra* note 67; Andrew Lund & Gregg Polksy, *The Diminishing Returns of Incentive Pay in Executive Compensation Contracts*, 87 NOTRE DAME L. REV. 677, 724–25 (2013); Tung, *supra* note 67; Bebchuk, Cohen, and Spammam, *supra* note 67; Zhiyong Dong, Cong Wang & Fei Xie, *Do Executive Stock Options Induce Excessive Risk Taking?*, 34 J. BANKING & FIN. 2518–2529, 2522 (2010).

¹⁵⁵ See *supra* section III.E.

¹⁵⁶ See, e.g., McLinden et al., *supra* note 9 at 1; Anderson Abel de Souza Machado et al., *Microplastics as an Emerging Threat to Terrestrial Ecosystems*, 24 GLOBAL CHANGE BIOLOGY 1, 1 (2018).

There may indeed be positive externalities to economic activity, but there is no reason to believe that positive externalities are correlated with either negative externalities or risk aversion.

If positive externalities are uncorrelated, and the limited liability tax falls most heavily on those activities that produce more negative externalities, then the limited liability tax is more efficient than taxes that fall equally on activities regardless of their output of positive and negative externalities. This is true even if *all* activities have net positive externalities, as long as one assumes that the government needs a source of revenue.¹⁵⁷ Any negative impact on economic growth or innovation from a limited liability tax could be offset with increases in public investment or reductions in other, less efficient taxes.¹⁵⁸

VII. *Administrative Details*

This section briefly considers specific issues relating to the administration of a limited liability tax.

A. *Multi-tier companies and pyramiding*

Companies and wealthy individuals routinely respond to taxation with tax avoidance strategies. Any tax regime therefore requires anti-evasion rules and enforcement. A likely tax avoidance strategy is to divide operations and assets between limited liability and non-limited liability entities¹⁵⁹ or create multi-tiered or pyramided entities. These strategies could be policed by consolidating the revenues of non-limited liability entities with those of the limited liability entities that have invested in them.

B. *Who should collect?*

A second question relates to who should collect the limited liability tax. Ostensibly, this should be any government entity that will absorb externalized harms. Such harms increase burdens on public insurance programs, such as those that provide health and disability benefits in the ordinary course, including Medicaid, Medicare, Social Security, and state and local equivalents. Economic damage could also erode the tax base. And externalized harms might require public bailouts if they are large enough. Externalization of losses represents a cost borne at least in part by various levels of government.

¹⁵⁷ There is also a safety valve if the government overprices, because private firms have the option of declining to pay for limited liability and seeking private insurance instead (at least for insurable risks up to insurable limits).

¹⁵⁸ See *infra* section VII.C.

¹⁵⁹ The classic example is the use of a corporation as a general partner in a limited partnership. Hamill, *supra* note 71 at 410–12. There are many examples of the use of “blocker” and “stopper” entities. Willard B. Taylor, “*Blockers*,” “*Stoppers*,” and the *Entity Classification Rules*, 64 TAX LAWYER 1–35, 1 (2010); see also LoPucki, *supra* note 79 (discussing judgment proofing strategies based around dividing operations between asset holding and risk-taking entities).

Federal limited liability taxes might be easier to administer and enforce. Federal taxes are less subject to competition and avoidance than state-level taxes. But state level taxes would facilitate different assessments of risk levels and enable regulators to observe firm responses at different price points. Firms that disagreed vehemently enough with states' assessments of risk could refuse to do business in those states, just as firms can decline to do business in states with excessive sales or income taxes, or overly plaintiff-friendly tort systems.

C. How should the money be spent?

A third question is how the revenue collected should be spent. How the money is spent is largely irrelevant to the goals of reducing information asymmetries regarding externalization risk, internalizing those risks and dynamically improving regulation, with one exception: funding an agency to gather and analyze the data about risk generated by the limited liability tax and firm elections, to study ostensibly hazardous activities more closely, and to make recommendations regarding regulation and mandatory insurance. However, such an agency (or agencies) would likely require only a fraction of the revenue.

All money flowing into and out of government is fungible. At some point, governments will spend money dealing with risks that have been externalized. The money collected can be used to pay down public debt, reduce other taxes, or increase spending in earlier periods, as long as the government is capable of increasing taxes or borrowing in later periods.

If policymakers were concerned that a limited liability tax could decrease investment and positive externalities,¹⁶⁰ then funds could be used to boost public investments that are complementary to innovation and economic growth, such as education, infrastructure and R&D spending,¹⁶¹ to invest directly in the private sector through a sovereign wealth fund that could also act as a rainy day fund,¹⁶² or to reduce taxes that decrease economic growth and are less targeted to risk externalization.¹⁶³ Establishing a rainy day fund may be advisable if it is easy for the potential tax base to permanently leave the jurisdiction and thereby

¹⁶⁰ See section VI.C.5.

¹⁶¹ L. Jay Helms, *The Effect of State and Local Taxes on Economic Growth: A Time Series--Cross Section Approach*, 67 REV. ECON. & STAT. 574–582 (1985) (“when [tax] revenue is used . . . to finance improved public services [such as education, highways, and public health and safety] the favorable impact on location and production decisions provided by the enhanced services may more than counterbalance the disincentive effects of the associated taxes.”); JEFFREY D. SACHS, THE PRICE OF CIVILIZATION: REAWAKENING AMERICAN VIRTUE AND PROSPERITY 18, 59, 175, 201, 220, 221, 258, 290 (Revised ed. edition ed. 2012) (discussing the need for increased funding for infrastructure, education, and R&D to promote economic growth); Michael Simkovic, *The Knowledge Tax*, 82 U. CHI. L. REV. 1981, 1982–2003 (2015) (discussing the links between education and economic growth and evidence of underinvestment in higher education); International Monetary Fund, *Unproductive Public Expenditures: A Pragmatic Approach to Policy Analysis*, 48 IMF PAMPHLET SERIES, (20-26) (2005) (discussing the relative contributions of education, infrastructure, health, nutrition, and military spending to economic growth).

¹⁶² Bader Alhashel, *Sovereign Wealth Funds: A Literature Review*, 78 J. ECON. & BUS. 1–13 (2015) (discussing the role of sovereign wealth funds in public saving and stabilizing government revenue and controversies surrounding their returns and the extent to which they act politically rather than economically).

¹⁶³ Simkovic, *supra* note 161 at 2030–34 (arguing for reductions in taxes that disproportionately burden skilled labor and investment in higher education and research); Jens Arnold, *Do Tax Structures Affect Aggregate Economic Growth? Empirical Evidence from a Panel of OECD Countries*, OECD ECONOMICS DEPARTMENT WORKING PAPERS NO. 643 (2008) (finding that individual and corporate income taxes have a more negative im-

escape taxation,¹⁶⁴ or if the government is liquidity constrained and would be unable to borrow at reasonable rates when externalized harms materialize.¹⁶⁵

Conclusion

This article contributes to the optimal tax, corporate tax, and regulation and insurance literatures by considering limited liability as a form of public insurance that encourages greater risk taking. In situations where businesses are already operating to maximize value for risk-neutral investors, limited liability will lead to risk taking that is socially excessive. Some specific risks that were externalized to the government or other members of the public have been identified in the past and addressed through regulation or mandatory public or private insurance programs. Nevertheless, these risks were not always known, and it stands to reason that at any given point in time there will be risks that have not yet been identified.

Although the precise nature and level of residual risks that might be externalized remain unknown, they are known unknowns: we know that these risks exist, that they are greater than zero, and that industry participants often understand them better than regulators or the general public. Taxing limited liability can help improve efficiency both by forcing businesses to signal their degree of riskiness by opting either for limited liability or lower taxes and by internalizing costs that would otherwise be externalized. This self-sorting would accelerate the risk discovery process by enabling those charged with managing risk to focus on self-identified high-risk firms. The key to maximizing the benefits, and minimizing the costs, of a limited liability tax is to price according to risk to the greatest extent possible.

pact on economic growth than property taxes); cf. Jing Xing, *Tax Structure and Growth: How Robust Is the Empirical Evidence?*, 117 ECON. LETTERS 379–382 (2012) (disputing the evidence that tax structure affects economic growth).

¹⁶⁴ Kane, *supra* note 131 (discussing corporate arbitrage of differences in international tax rates); Mitchell A. Kane & Edward B. Rock, *Corporate Taxation and International Charter Competition*, 106 MICH. L. REV. 1229 (2008) (discussing taxation and regulatory competition).

¹⁶⁵ See, e.g., Henning Bohn, *The Behavior of U.S. Public Debt and Deficits*, 113 Q. J. ECON. 949–963 (1998) (arguing that U.S. federal borrowing capacity may have limits); James D. Hamilton & Marjorie A. Flavin, *On the Limitations of Government Borrowing: A Framework for Empirical Testing*, 76 AM. ECON. REV. 808–819, 819 (1986) (same); cf. John H. Cochrane, *A Frictionless View of U.S. Inflation*, 13 NBER MACROECON. ANN. 323–384 (1998) (arguing that inflation adjusts to ensure fiscal solvency).